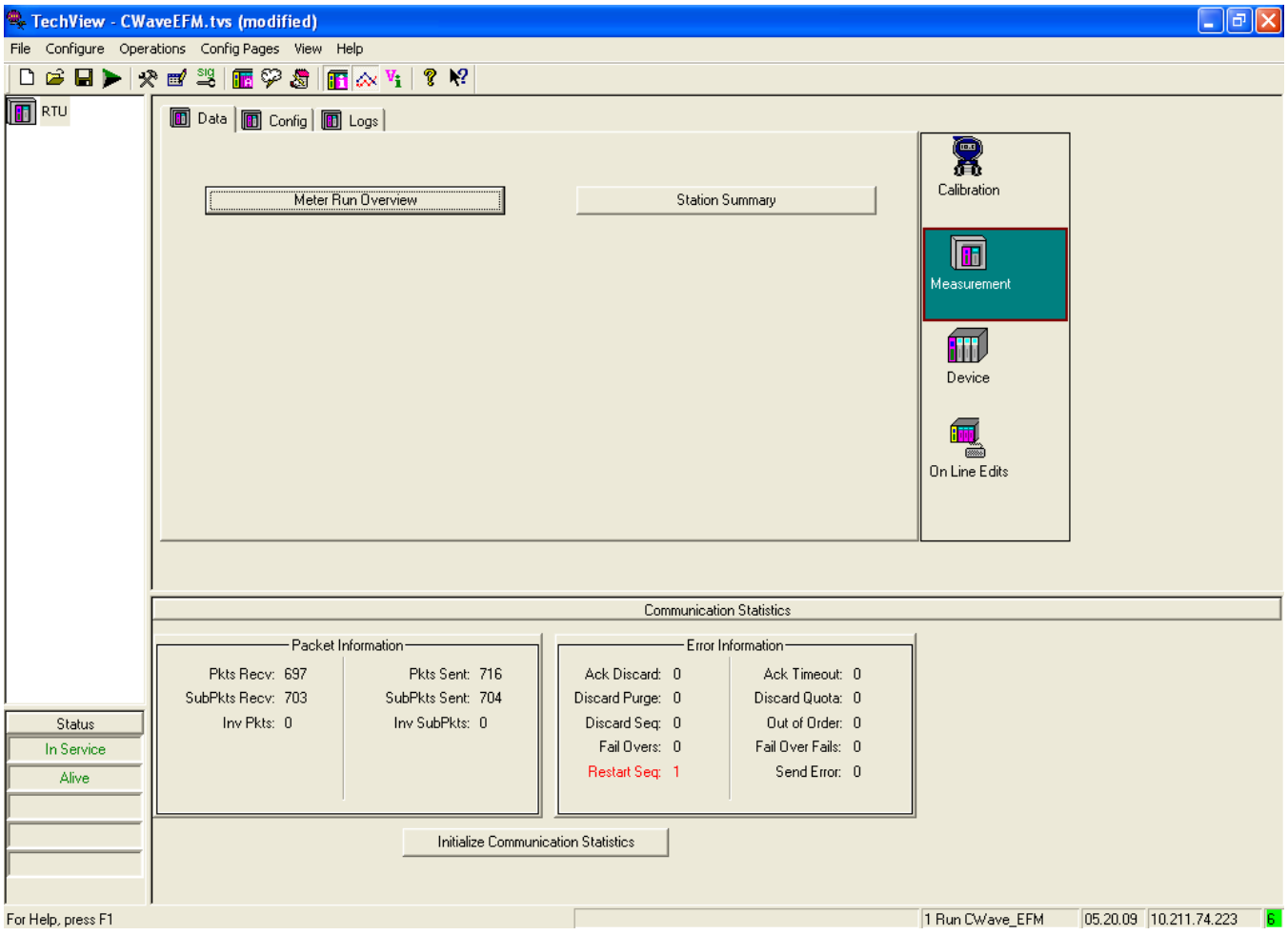
User Manual
Document: D5131
Part: D301430X012
December 2014

OpenBSI Version 5.9

TechView User's Guide



EMERSON. Process Management

IMPORTANT! READ INSTRUCTIONS BEFORE STARTING!

Be sure that these instructions are carefully read and understood before any operation is attempted. Improper use of this device in some applications may result in damage or injury. The user is urged to keep this book filed in a convenient location for future reference.

These instructions may not cover all details or variations in equipment or cover every possible situation to be met in connection with installation, operation or maintenance. Should problems arise that are not covered sufficiently in the text, the purchaser is advised to contact Emerson Process Management, Remote Automation Solutions for further information.

EQUIPMENT APPLICATION WARNING

The customer should note that a failure of this instrument or system, for whatever reason, may leave an operating process without protection. Depending upon the application, this could result in possible damage to property or injury to persons. It is suggested that the purchaser review the need for additional backup equipment or provide alternate means of protection such as alarm devices, output limiting, fail-safe valves, relief valves, emergency shutoffs, emergency switches, etc. If additional information is required, the purchaser is advised to contact Remote Automation Solutions.

RETURNED EQUIPMENT WARNING

When returning any equipment to Remote Automation Solutions for repairs or evaluation, please note the following: The party sending such materials is responsible to ensure that the materials returned to Remote Automation Solutions are clean to safe levels, as such levels are defined and/or determined by applicable federal, state and/or local law regulations or codes. Such party agrees to indemnify Remote Automation Solutions and save Remote Automation Solutions harmless from any liability or damage which Remote Automation Solutions may incur or suffer due to such party's failure to so act.

ELECTRICAL GROUNDING

Metal enclosures and exposed metal parts of electrical instruments must be grounded in accordance with OSHA rules and regulations pertaining to "Design Safety Standards for Electrical Systems," 29 CFR, Part 1910, Subpart S, dated: April 16, 1981 (OSHA rulings are in agreement with the National Electrical Code).

The grounding requirement is also applicable to mechanical or pneumatic instruments that include electrically operated devices such as lights, switches, relays, alarms, or chart drives.

EQUIPMENT DAMAGE FROM ELECTROSTATIC DISCHARGE VOLTAGE

This product contains sensitive electronic components that can be damaged by exposure to an electrostatic discharge (ESD) voltage. Depending on the magnitude and duration of the ESD, this can result in erratic operation or complete failure of the equipment. Read supplemental document S14006 for proper care and handling of ESD-sensitive components.

Contents

Chapter 1 – Introduction - What is TechView? 1-1

Chapter 2 – TechView Installation 2-1

Chapter 3 – Starting TechView and Establishing Communications 3-1

3.1 Starting Your Session: 3-1
3.2 Establishing Communications 3-2
3.2.1 Communication Setup page - BSAP 3-2
3.2.2 Communication Setup page - IP 3-3
3.2.3 Advanced Communication Parameters – BSAP 3-4
3.2.4 Advanced Communication Parameters – IP 3-7
3.2.5 Node Setup 3-8
3.2.6 Calibration Setup 3-10
3.2.7 Transmitter Setup (Only Visible if using Remote Access) 3-13
3.3 Signing On to the RTU 3-15

Chapter 4 – Overview of TechView Functions 4-1

4.1 Changing the Session Parameters You Entered 4-2
4.2 Restarting the Session 4-3
4.3 Saving Your Session File 4-3
Copying Your Session to Another Session File Name 4-3
4.4 Application Settings 4-3
4.4.1 Startup tab 4-4
4.4.2 Security tab 4-7
4.4.3 General tab 4-7
4.5 Calibration and Verification Signals 4-8
4.5.1 Extended Verification 4-9
4.5.2 Changing the Name of a Transmitter 4-11
4.6 Changing the Local Address / Group Number 4-11
4.6.1 Starting the Flash Configuration Utility 4-12
4.6.2 Show Firmware Version in Node 4-12
4.6.3 Writing an Audit Note 4-12
4.6.4 Viewing OpenBSI Workstation Communication Statistics 4-13
4.6.5 Deleting Historical Files from the RTU (Clear History) 4-13

Chapter 5 – Calibration Overview 5-1

5.1 Why is Calibration Necessary? 5-1
5.2 Calibration Concepts 5-1
5.3 Before You Begin 5-3
5.4 Equipment Required for Calibration 5-5
5.4.1 Equipment Required For Pressure Calibration 5-5
5.4.2 Equipment Required For Temperature Calibration 5-7
5.4.3 Equipment Required for Analog Output Calibration (3808 only) 5-7
5.4.4 Entering Calibration Mode / Leaving Calibration Mode 5-7

Chapter 6 – Calibrating the 3508 series TeleTrans Transmitter 6-1

6.1 Calibration of Differential/Gage Pressure 6-1

6.2 Calibration of Static Pressure 6-3
6.3 Calibration of RTD Temperature....6-5

Chapter 7 – Calibrating the 3808 Transmitter 7-1
7.1 Calibration of Gage or Differential Pressure (3808-10A/3808-30A only)....7-1
7.2 Calibration of Static Pressure (3808-30A ONLY) 7-2
7.3 Calibration of RTD Temperature....7-3
7.4 Calibrating the Analog Output (Analog Pressure Transducer models ONLY)....7-5

Chapter 8 – Calibrating the 3530 TeleFlow-series Flow Computers 8-1
8.1 Calibration of Differential/Gage Pressure 8-1
8.2 Verification of Differential Pressure....8-2
8.3 Calibration of Static Pressure 8-2
8.4 Verification of Static Pressure....8-3
8.5 Calibration of RTD Temperature....8-4
8.5.1 Verification of RTD Temperature 8-6
8.6 Damping....8-6
8.6.1 Configuring the Damping Time 8-7
8.7 Calibrating TeleRecorder Inputs (3530-45B/55B ONLY)....8-7
8.7.1 Calibrating the Input....8-8

Chapter 9 – Calibrating the ControlWave EFM / GFC-CL /GFC/ XFC 9-1
9.1 Calibration of Differential/Gage Pressure 9-1
9.2 Verification of Differential/Gage Pressure....9-2
9.3 Calibration of Static Pressure 9-4
9.4 Verification of Static Pressure....9-5
9.5 Calibration of RTD Temperature....9-6
9.6 Verification of Temperature....9-9
9.7 Damping....9-11
9.7.1 Configuring the Damping Time 9-11
9.8 Orifice....9-12
9.8.1 Specifying the Orifice Plate Size....9-12

Chapter 10 – Configuring and Calibrating the 4088B 10-1
10.1 Configuring the 4088B 10-1
10.1.1 DP/GP Pressure....10-2
10.1.2 Static Pressure....10-2
10.1.3 Temperature....10-3
10.1.4 Serial Port Setup....10-4
10.1.5 Transmitter Data 10-5
10.1.6 RTD Coefficients....10-6
10.2 Calibrating the 4088B....10-6
10.2.1 Calibration of Gage or Differential Pressure 10-7
10.2.2 Calibration of Static Pressure 10-7
10.2.3 Calibration of RTD Temperature....10-8

Chapter 11 – Online Editing (ControlWave only) 11-1
11.1 On-line Editing of Signal Lists....11-1
11.2 On-line Editing of Archive Files....11-4
11.2.1 Archive Fields....11-6
11.2.2 Batch Editing of Archive Files 11-7

Chapter 12 – Device and Measurement Groups 12-1

Appendix A -Initialization Files **A-1**

Creating an Advanced Interface Setup File for Storage at the RTU A-2
To create an Advanced Interface Setup Zip File for a custom application: A-2
AISF.TVS File Format A-3
Configuration Initialization (*.INI) Files (Platform-dependent) A-5
LISTS.INI A-15
TRANSLATION.INI Initialization File A-16
Notes about IP Address Formats in TVS Files A-19

Index **IND-1**

This page is intentionally left blank

Chapter 1 – Introduction - What is TechView?

TechView is a standalone software package that allows a technician to:

- Calibrate transmitter(s) either locally (bench configuration) or via communication with the transmitter's master controller (RTU).
- Perform certain basic configuration operations on a controller, flow computer, or transmitter, such as changing the local address or EBSAP group number.
- Collect real-time or historical data from the controller, flow computer, or transmitter.
- Start other OpenBSI programs or utilities to perform other activities, such as the Flash Configuration utility.
- Perform on-line edits to signal lists, and to the structure of archive files in ControlWave-series controllers. (Requires 4.60 or newer ControlWave firmware.)

Typically, you install TechView software on a portable laptop computer to allow the technician to bring it to the site of the RTU/transmitter. You could also install it on a desktop computer in a lab for bench configuration of a transmitter.

You can use TechView to calibrate the RTD temperature circuitry and /or the MVT/GPT pressure transducer for the following products:

- 3508 TeleTrans Transmitter
- 3808 MVT Transmitter (Firmware Version 1.5 or newer)
- 3530-10B TeleFlow Electronic Gas Measurement Computer
- 3530-20B TeleFlow Plus
- 3530-45B TeleRecorder
- 3530-50B TeleFlow Corrector
- 3530-55B TeleRecorder
- Rosemount 4088B Transmitter
- ControlWave EFM
- ControlWave GFC
- ControlWave XFC

Chapter 2 – TechView Installation

Note: For minimum system requirements and more detailed installation instructions, refer to *Chapter 2* of the *OpenBSI Utilities Manual* (D5081).

1. Log into the workstation with administrative privileges.
2. Insert the OpenBSI CD-ROM in your CD-ROM drive.
3. If your CD-ROM drive has autorun enabled, skip to the next step. Otherwise, open a DOS prompt with administrative privileges, then set the folder to the CD root directory, and run the same "open" command that is in the autorun.inf file on the CD, for example "demo32.exe openbsi.dbd". When the CD browser screen appears, choose the **Install OpenBSI** option.

   A screen reminds you to close all other programs, and warns you that older OpenBSI versions will be removed. Click **Next**.
4. A license agreement screen opens. Review the agreement, using the scroll bar to bring it into view. Click **I accept the terms of the license agreement** to proceed. Then click **Next**.
5. On the next screen, you can specify the user files folder. The system stores user files such as ControlWave projects, ACCOL files, recipes, and network files in sub-folders of this folder. **Note:** If User Account Control (UAC) is enabled in Windows, you must have write access to this folder. The default is **C:\ProgramData\Bristol\Openbsi.** Use the default or use **Browse** to specify a different user files folder. When finished click **Next**.
6. On the next screen, use the check-boxes to select either Network Edition (if you purchased the full Network Edition) or BSI_Config if you are using the free BSI_Config package. These are the packages which include TechView.
7. Once you make your choices, click **Next.**
8. This is your last opportunity to make any changes prior to starting the installation. If you want to make changes, you can click **Back** to go back to earlier pages. If you want to read the printed release notes for this version of OpenBSI, check the **View the Release Notes** box.
9. If you are ready to perform the installation, click **Install**, and the installation process starts. Be patient, as it may take several minutes to install all of the different utilities, depending upon which you choose.
10. When the installation completes, re-boot your computer when prompted. This must be done in order for OpenBSI to function properly. If you choose not to re-boot now, you must do so before

running OpenBSI. Click F**inish**, and the installation will be complete, and re-boot will proceed, if you chose to do it now.

After re-boot, an "OpenBSI Tools" menu selection is added to your Windows Start Programs menu through which you can access the various OpenBSI utilities. If you prefer, you can create Windows™ shortcuts to the tools to provide access through icons on the desktop. See your Windows™ documentation for information on how to do this.

Chapter 3 – Starting TechView and Establishing Communications

Note: Neither LocalView nor NetView can be running on your computer at the same time you are running TechView. If either of those programs are running, you must shut them down, first.

Click **Start** > **Programs** > **OpenBSI Tools** > **TechView**

In This Chapter

3.1 Starting Your Session: 3-1
3.2 Establishing Communications....3-2
3.2.1 Communication Setup page - BSAP. 3-2
3.2.2 Communication Setup page - IP 3-3
3.2.3 Advanced Communication Parameters – BSAP 3-4
3.2.4 Advanced Communication Parameters – IP 3-7
3.2.5 Node Setup....3-8
3.2.6 Calibration Setup....3-10
3.2.7 Transmitter Setup (Only Visible if using Remote Access) .3-13
3.3 Signing On to the RTU....3-15

3.1 Starting Your Session:

The configuration information you specify to allow TechView to communicate with controllers, flow computers and transmitters is stored in a **session file**. Session files have a file extension of *.TVS. .

Once you have a session file saved, you can start TechView by standard Windows™ methods such as typing 'TechView' on the command line, followed by the path and name of the session file (excluding the TVS extension), or you can drag a TVS file icon onto a shortcut icon for the TechView application.

Note: If you use the command line option, put quotation marks around the path or filename if it includes spaces.

When first starting TechView, by default, the software prompts you to open an existing session file.

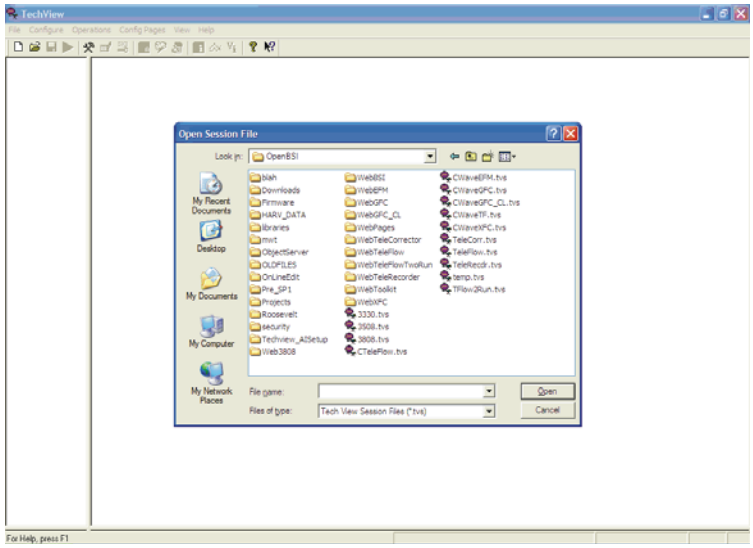


Figure 3-1. Opening a Session File

Note: You can change the initial prompt for the user from the Application Settings dialog box.

Select the session file name you want to open, then click **Open**.

3.2 Establishing Communications

You can establish communication with all RTUs/transmitters using the BSAP protocol. For some RTUs you may also use Internet (IP) protocol.

On the Communication Setup page, choose either **BSAP** or **IP** in the **Select Communication Protocol** field.

3.2.1 Communication Setup page - BSAP

For **BSAP** communication, specify the BSAP local address of the RTU or transmitter:

If you know the BSAP local address, select the **Specify Local Address** button, and choose the address using the list box, or enter it directly.

If you want the user to specify the local address at startup, select **Ask for Local Address at startup**; the user will be prompted to enter the address.

If you want TechView at startup to attempt to find the local address by sequentially polling each possible local address (1-127) at the current baud rate, select **Auto Detection**.

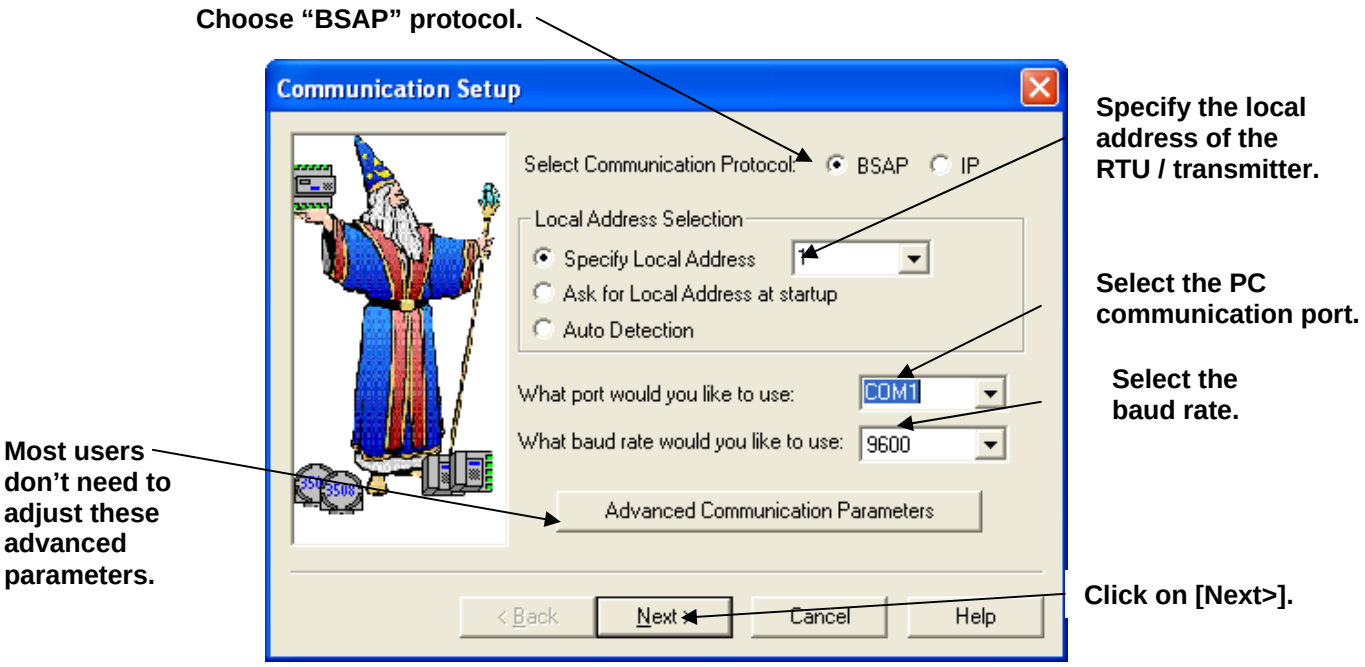


Figure 3-2.Communication Setup dialog box (BSAP)

Specify the PC communication port, e.g. COM1, COM2, etc. in the **What port would you like to use** field.

Specify the baud rate used by the port in the **What baud rate would you like to use** field. If you are making an FSK connection to a 4088B, this must be 1200.

Most users don't need to adjust the advanced parameters, but if you need to, click on **Advanced Communication Parameters**. (Information on this dialog box is included later in this section.)

Click on **Next** to proceed to the next page.

3.2.2 Communication Setup page - IP

For **IP** communication, you must specify the IP address of the RTU.

If you want the user to specify the IP address at startup, select **Ask for IP Address at startup**; the user will be prompted to enter the address.

Most users don't need to adjust the advanced parameters, but if you need to, click **Advanced Communication Parameters**. (Information on this dialog box is included later in this section.)

Click **Next** to proceed to the next page.

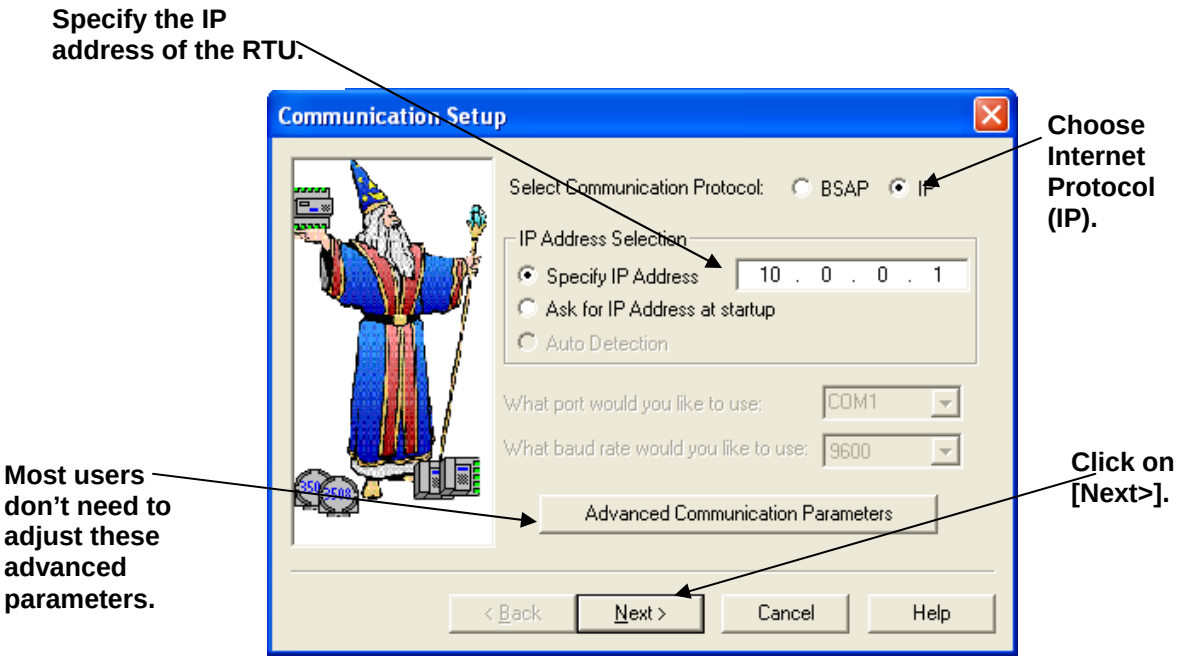


Figure 3-3. Communication Setup dialog box (IP)

3.2.3 Advanced Communication Parameters – BSAP

Most users should not edit these parameters. If however, you are having certain communication problems, you may edit these parameters to better tune your system.

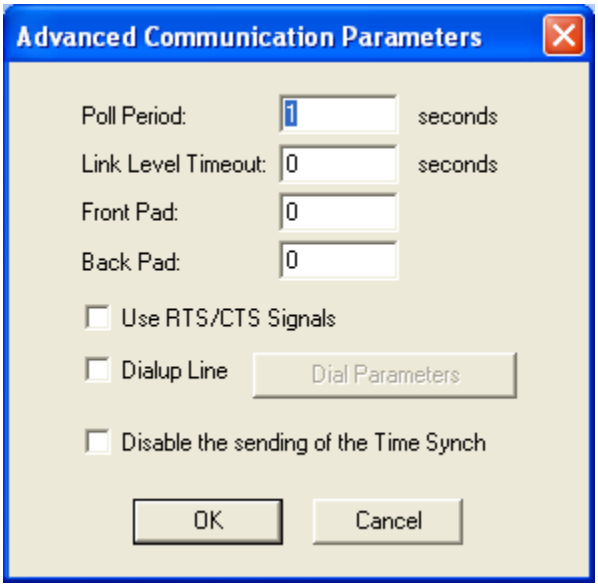


Figure 3-4. Advanced Communication Parameters dialog box (BSAP)

Field	Description
Poll Period	This is the rate (in seconds) in which TechView polls the directly connected RTU.
Variable	This is the amount of time, in seconds, that TechView waits for a response from an RTU or transmitter before assuming that the unit is dead and will not respond.
Front Pad, Back Pad	These fields specify the number of null characters to insert at the beginning (front) or ending (back) of a message. Null characters may be useful in situations where there may be a momentary delay which could cause the start of a message to be missed, for example, while a radio link is being activated. Null characters are also necessary if you are communicating using a 2-wire RS-485 link, to **e**nsure that DTR is not dropped prematurely. To determine the delay caused by null packing, perform the following calculation: seconds of delay = (number of null characters x 10) / baud rate On an FSK connection, use "3" back pad for model 4088B. Use "2" or "3" Back Pad for models 3508 and 3808.
Use RTS/CTS Signals	If your communication line uses Ready to Send (RTS) / Clear to Send (CTS) signals (not to be confused with ACCOL signals), check this box.
Disable the sending of the Time Synch	Check this box to prevent TechView from sending a BSAP time synch message. (Requires OpenBSI 5.8 Service Pack 1 or newer.) The default setting for this is set in the Advanced Configuration utility. See *Appendix E* of the *OpenBSI Utilities Manual* (D5081) for details on the Advanced Configuration utility.
Dialup Line / Dial Parameters	If using a dial line to communicate with the controller, check this box, then click the **Dial Parameters** button, and specify the dialing parameters.

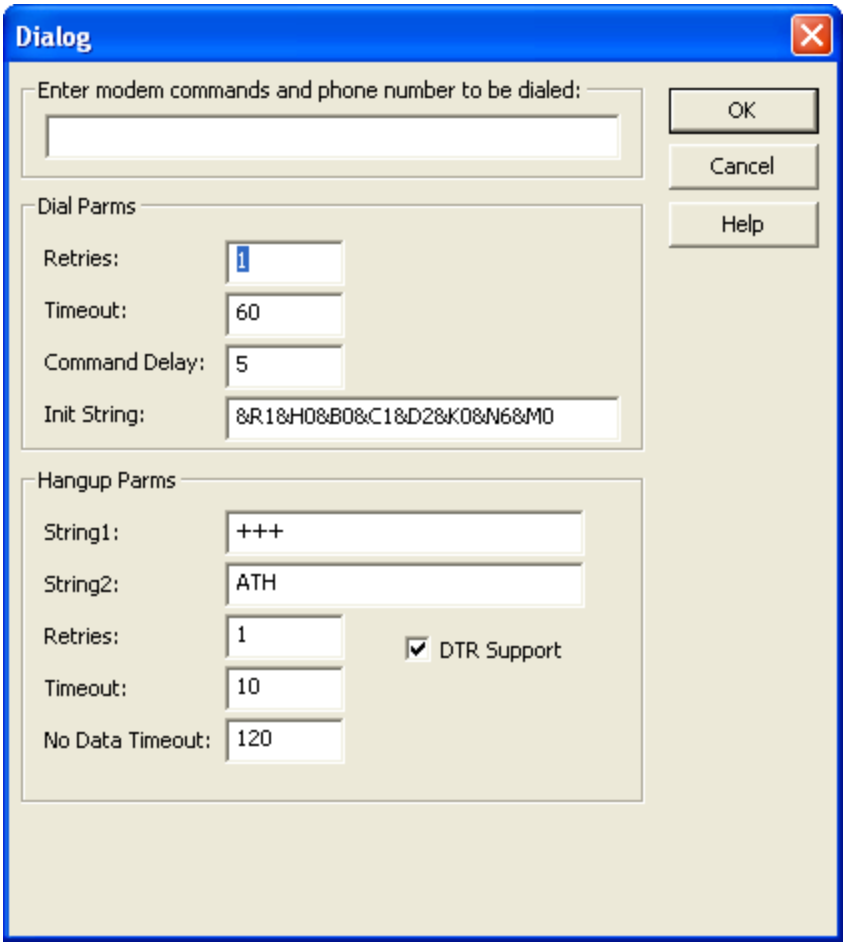


Figure 3-5. Dial Parameters

Field	Description
Dial-up Parameters:	
Enter modem commands and phone number to be dialed	Enter any modem commands, as well as the dial string here.
Retries	This is the number of attempts TechView makes to dial a controller (RTU), before declaring that it is off-line. This must be an integer from 0 to 10.
Timeout	This is the period of time (in seconds) TechView waits before declaring a dialing attempt to be a failure.
Command Delay	This is the period of time (in seconds) TechView waits between sending commands.
Init String	This is an initialization string for the modem. TechView immediately precedes the initialization string with the "AT" modem command. TechView sends the initialization string ahead of the dial-up string.
Hang-up parameters:	
String1	This is the first string TechView sends to the modem when an attempt is made to hang up.

String2	This is the second string TechView sends to the modem when an attempt is made to hang up.
Retries	This is the number of attempts which will be made to hang up the modem before declaring a hang-up failure. This value must range from 0 to 10.
Timeout	This is the amount of time TechView waits before declaring an attempt to hang up to be a failure.
No Data Timeout	This value specifies the amount of time (in seconds) after which the modem should be hung up if there has been no communication (other than poll messages) between TechView and the controller.
DTR Support"	If you check this box, TechView will drop DTR in order to hang up, before sending the hang-up strings, and TechView will raise DTR before dialing.

Click **OK** to save the dial-up and hang-up parameters.

3.2.4 Advanced Communication Parameters – IP

Most users should not edit these parameters. If however, you are having certain communication problems, you can edit these parameters to better tune your system.

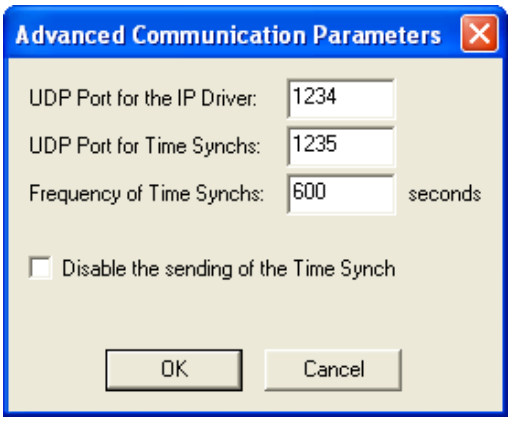


Figure 3-6. Advanced Communication Parameters dialog box (IP)

Field	Description
UDP Port for the IP Driver	The **UDP Port Number for IP Driver** (sometimes known as the socket number) is used for communication with RTUs. It is used to split message traffic along different 'streams'. All PCs or RTUs which are to communicate with each other must have the same **UDP Port Number for IP Driver**. In a sense, this value is like a common password which must be known by each node in the network. If no value is entered, TechView assigns a default value for use throughout the network when the system is first created. (**Note**: Although the term "UDP port" is used, it has no actual relationship with the physical communication ports.) **Note**: The **UDP Port Number for IP Driver** should *never* be 0.
UDP Port for Time Synchs	The **UDP Port Number for Time Synch** is used for time synchronization of the RTUs. All PCs or RTUs must have this value defined, or else they will be unable to receive time synchronization messages. In a sense, this value is like a common password which must be known by each node in the network. If no value is entered, TechView assigns a default value for use throughout the network when the system is first created. (**Note:** Although the term "UDP port" is used, it has no actual relationship with the physical communication ports.) **Note**: The **UDP Port Number for Time Synch** should *never* be 0.
Frequency of Time Synchs	This value specifies (in seconds) how often time synchronization messages should be sent to IP RTUs.
Disable the sending of the Time Synch	Check this if you want to disable the transmission of time synch messages.

3.2.5 Node Setup

Next, you must identify certain characteristics of the unit to which you are trying to communicate. The appearance of the Node Setup page varies somewhat, depending upon what type of RTU you are configuring:

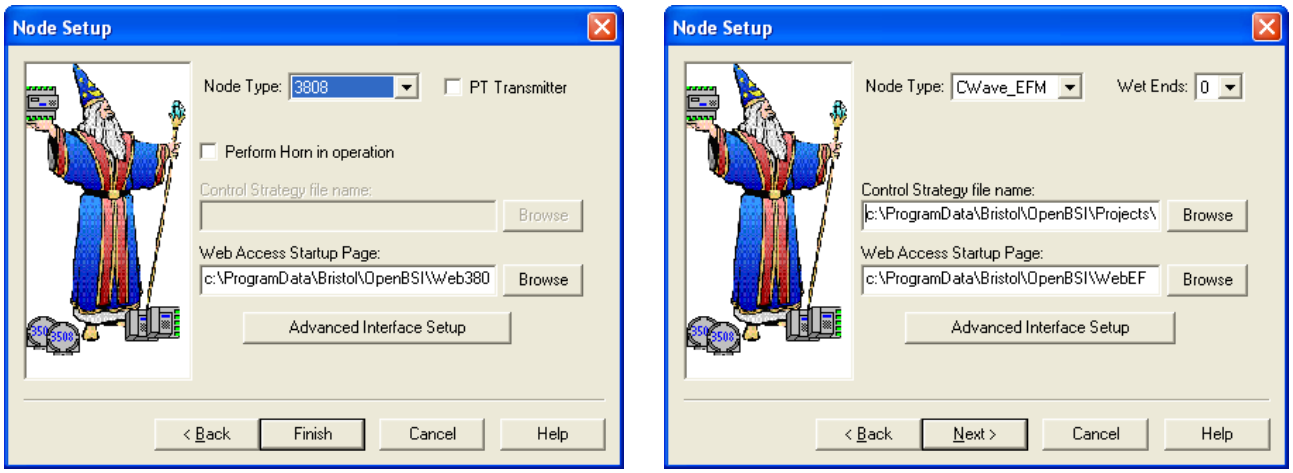


Figure 3-7. Node Setup dialog box (appearance varies based on node type)

Field	Description	
Node Type	The type of controller, RTU, flow computer, or transmitter. Valid choices include:	
	3305	RTU 3305 controller
	3310	RTU 3310 controller
	3330	DPC 3330 controller
	3335	DPC 3335 controller
	3508	Model 3508 TeleTrans transmitter
	3530	3530-series TeleFlow / TeleRTU TeleCorrector/TeleRecorder
	3808	Model 3808 transmitter
	4088B	Rosemount 4088B transmitter
	ControlWave	ControlWave Process Automation Controller
	CW_10	ControlWave_10 controller
	CW_30	ControlWave_30 controller
	CW_35	ControlWave_35 roller
	CWave_EFM	ControlWave Electronic Flow Meter
	Cwave-Exp	ControlWave Express Gas Flow Computer
	Cwave_GFC	ControlWave Gas Flow Computer
	ControlWave_LP	ControlWave Low Power Controller
	CWave_Micro	ControlWave Micro Controller
	CWave_XFC	ControlWave Explosion-Proof Flow Computer (3820)
PT Transmitter	When checked indicates that communication will be with a gage pressure transmitter. There will be no static pressure. When not checked, indicates that the transmitter has both differential and static pressures. This applies only to 3508/3808 units.	

Wet Ends	Certain RTUs (EFM, GFC, XFC) may include a built-in internal transmitter with sensor (wet end). Some versions of the XFC can include 2 wet ends. Specify the number of wet ends for this RTU.
Perform Horn in operation	If checked, the transmitter's communication with the BBTI board will be temporarily suspended, so that a different program can communicate with the transmitter.
Control Strategy Resource	If this ControlWave project has multiple resources, select the resource which is currently running in the unit.
Load Type	(Not shown) If communication is with a 3530 TeleFlow-series unit, specify which of the standard application ACCOL loads (or C load) is running in the unit. If needed, you can then use the **Calibration Signal Configuration** button to specify different signal names for the configuration signals associated with the load. **Note:** If the load type you specify here does **not** match the load type running in the controller, TechView prompts you to change the load type so that it does match the one running in the controller.
Control Strategy file name	You can specify a control strategy to be used in conjunction with the RTU used in this application. For the 33XX line of RTUs, this is the name of the ACCOL load running in the RTU. For the ControlWave line of RTUs, this is the name of the .MWT project running in the RTU. Click **Browse** to locate the file. **Note***: 3508 and 3808 Transmitters don't have a control strategy file.*
Web Access Startup Page	You can optionally specify a default web page for this RTU, which you may start while you are in TechView. Click **Browse** if necessary, to locate it.
Advanced Interface Setup	Most users use the standard configuration INI files that come with TechView. Some advanced users, however, may want to customize the organization of pages within TechView. This button calls up a dialog box allowing you to identify special configuration files for TechView. For details on this subject, please see *Appendix A* of this manual.

3.2.6 Calibration Setup

This page specifies certain parameters that tell TechView how it will access the transmitters for calibration.

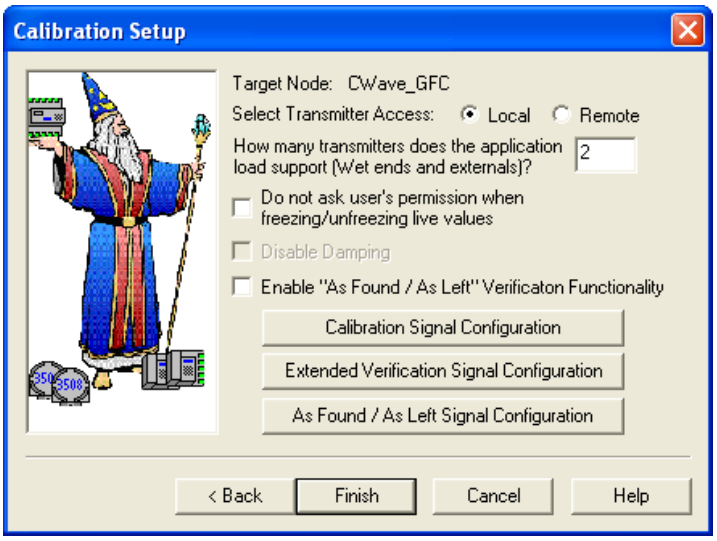

Calibration Setup
Target Node: CWave_GFC
Select Transmitter Access: Local Remote
How many transmitters does the application load support (Wet ends and externals)?
2
Do not ask user's permission when freezing/unfreezing live values
Disable Damping
Enable "As Found / As Left" Verificaton Functionality
Calibration Signal Configuration
Extended Verification Signal Configuration
As Found / As Left Signal Configuration
< Back
Finish
Cancel
Help

Figure 3-8. Calibration Setup dialog box

Field	Description
Target Node	Displays the type of node chosen in the Node Setup dialog box.
Select Transmitter Access Local / Remote	This field only applies for BSAP communication connections. For 3508 and 3808 series transmitters, checking **"Local"** means that TechView will communicate locally with a transmitter directly connected to the PC, on Level 1 of the temporary BSAP network. For Network 3000 (except for the 3530-series) checking the **"Remote"** box means that TechView will communicate with an RTU directly connected to the PC, on level 1 of the BSAP network. This RTU has one or more transmitters connected to it that will be on Level 2 of the temporary BSAP network. **Note:** The 3530-series does **not** support Remote access. **Note**: In Remote Access, if your Network 3000 RTU is not currently part of a network, i.e. you are working in the lab, or performing bench testing, you should connect through the Slave Port. Conversely, if you are working in the field, with an RTU that is already part of a network, you should connect through the Pseudo Slave Port. **Note**: If you select **Remote** the Transmitter Setup page will be added to your Session configuration.
How many transmitters does the application load support (Wet ends and externals)?	If using the ControlWave Express/EFM/GFC/XFC series, with multiple transmitters, the application running in the ControlWave EFM/GFC/XFC must support multiple meter runs and TechView configures the transmitter(s) by setting parameters within the RTU's multi-run application; and calibration success/failure will be noted as an audit record in the multi-run application. You must specify the total number of transmitters (both internal wet ends, and external transmitters) here.

	Note: If you want to use TechView to communicate with an RTU that doesn't require any calibration, you can hide calibration options by setting this to 0. (OpenBSI 5.8 Service Pack 1 and newer.)
Disable Damping	If your ControlWave RTU has an internal transmitter that doesn't require damping, you can disable damping functions by selecting this box. (OpenBSI 5.8 Service Pack 1 and newer.)
Do not ask user's permission when freezing/unfreezing live values.	When the user enters calibration mode, live values for differential pressure, static pressure, gage pressure, and temperature are frozen (i.e. the RTU will collect no new values from the transmitter, during calibration mode.) A prompt appears warning the user of this, and giving them the option of *not* entering calibration mode. Similarly, when the user tries to exit calibration mode, the user will be prompted to confirm that they want to exit, thereby unfreezing live values. If you check this box, however, these warning boxes will not appear, and the user will automatically enter/exit calibration mode. If you don't check it, the warning prompts will appear, giving the user the option of aborting the starting or exiting of calibration mode.
Enable "As Found/As Left" Verification Functionality	Check this button to activate the "As Found/As Left" feature for calibration logs. (OpenBSI 5.8 and newer.) **Note:** You **cannot** use this feature if you are also using the extended verification feature; they are mutually exclusive.
Calibration Signal Configuration	If you have modified a standard application with different calibration signal or variable names, the **[Calibration Signal Configuration]** button allows you to specify the new signal/variable names.
Extended Verification Signal Configuration	If you have modified an application that uses the extended verification feature for Modbus messages, and specified different variable names for the extended verification signal configuration feature, click the **Extended Verification Signal Configuration** button to specify the new variable names. (OpenBSI 5.8 Service Pack 2 and newer.) **Note:** Extended verification only applies to external transmitters. In addition, the Extended Verification and As Found/As Left functions are mutually exclusive.
As Found / As Left Verification Signal Configuration	If you have modified a standard application with different verification signal or variable names, the **As Found / As Left Verification Signal Configuration** button allows you to specify the new signal/variable names. (OpenBSI 5.8 and newer.) **Note:** The As Found/As Left and Extended Verification features are mutually exclusive.

If you chose **Local** for **Select Transmitter Access**, click **Finish**; if you chose **Remote** click **Next**.

3.2.7 Transmitter Setup (Only Visible if using Remote Access)

First, specify the number of transmitters connected below this RTU.

Specify the number of transmitters below this RTU

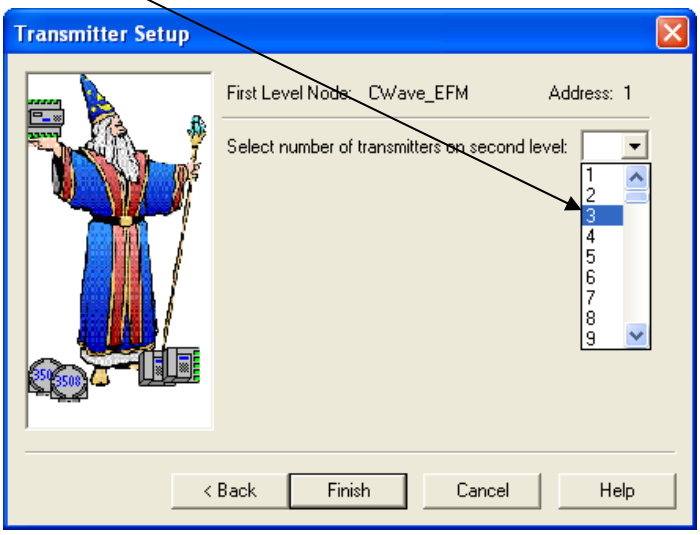


Figure 3-9. Transmitter Setup dialog box – Initial View

If desired, you can change the **Local Address** and the **Type** of the transmitter from the Transmitter Identification dialog box.

To modify the address or type of a transmitter in the list, either double-click on the transmitter's name, or click on the name, and then click on **Modify** and make the changes in the Transmitter Identification dialog box.

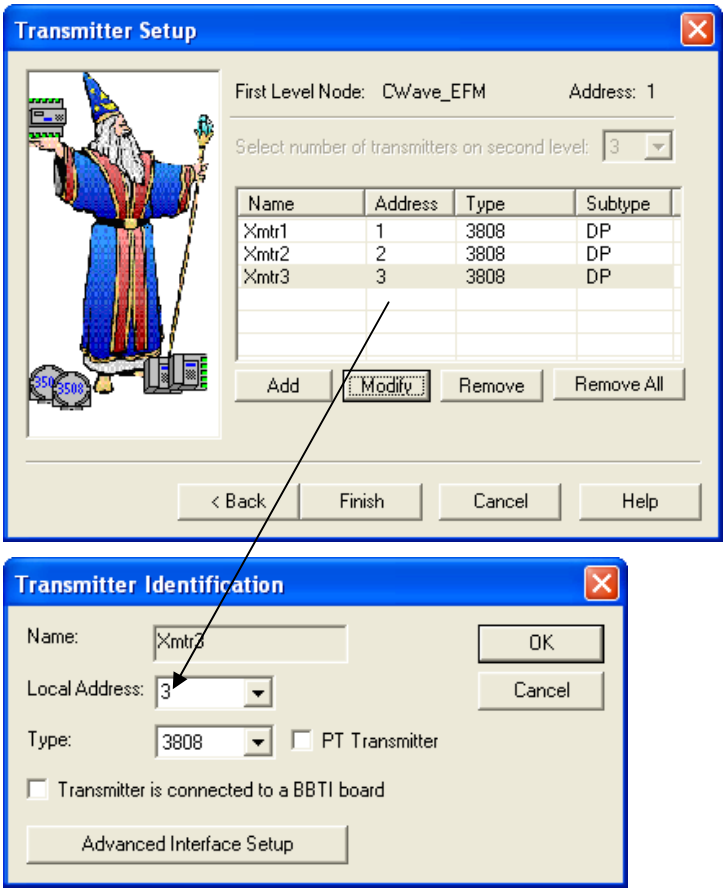


Figure 3-10. Transmitter Identification

To add another transmitter to the list, click **Add** and fill in the fields in the Transmitter Identification dialog box.

To remove a transmitter from the list, click on the transmitter's name, then click **Remove**.

To remove all of the transmitters from the list, click on **Remove All**.

Click **OK** when finished.

When you have finished configuration for the transmitters, click **Finish**.

3.3 Signing On to the RTU

Once you click **Finish** and communications have been successfully established with the RTU, TechView prompts you for a **Username** and **Password**.

Figure 3-11. SignOn to RTU

Enter the username/password combination, and click **Signon**. The RTU must recognize this username/password combination as valid in order for you to gain access.

Notes:

- Some customers may choose to set up a default username/password, to avoid having to enter it repeatedly. See Application Settings later in this manual, for details.
- If you use TechView to call up web pages, for example, in the **Measurement** group, do **not** sign off from the Sign-On/Off web page control unless you intend to also exit TechView, since the web pages, and TechView share the same connection to the RTU. If you only want to exit web pages, but continue with TechView, just close the web pages, from the standard windows control, don't sign off.
- If you are unable to sign on to the RTU, because it needs to be downloaded first, you can do this without logging on. In TechView, click on **Operations > Download First Level Node** to call up the Downloader and download a control strategy file to the RTU. You can then proceed to download.

Chapter 4 – Overview of TechView Functions

The basic functions of TechView are available through the menu bar, and tool bar items (see *Figure 4-1*).

In This Chapter

4.1 Changing the Session Parameters You Entered....4-2
4.2 Restarting the Session....4-3
4.3 Saving Your Session File....4-3
Copying Your Session to Another Session File Name....4-3
4.4 Application Settings....4-3
4.4.1 Startup tab....4-4
4.4.2 Security tab....4-7
4.4.3 General tab....4-7
4.5 Calibration and Verification Signals....4-8
4.5.1 Extended Verification....4-9
4.5.2 Changing the Name of a Transmitter....4-11
4.6 Changing the Local Address / Group Number....4-11
4.6.1 Starting the Flash Configuration Utility....4-12
4.6.2 Show Firmware Version in Node....4-12
4.6.3 Writing an Audit Note....4-12
4.6.4 Viewing OpenBSI Workstation Communication Statistics....4-13
4.6.5 Deleting Historical Files from the RTU (Clear History)....4-13

Standard sets of configuration/calibration pages specific to each type of transmitter, or RTU containing a transmitter, are included when you install TechView.

Based on your choice of node type, these pages load in a series of one or more groups, accessible via icons on the right hand side of the page. When you choose a particular group, the associated pages appear on the screen, or menu items which call them appear, depending upon the number of pages. Once the group is activated, you can proceed to perform the calibration, configuration, or online editing for your RTU/transmitter.

The **Calibration** group is always required. Additional groups may exist for other functions. Advanced users can also change the organization of the pages in groups, by editing TechView initialization files. For more information on changing these initialization files, see *Appendix A – Initialization Files*.

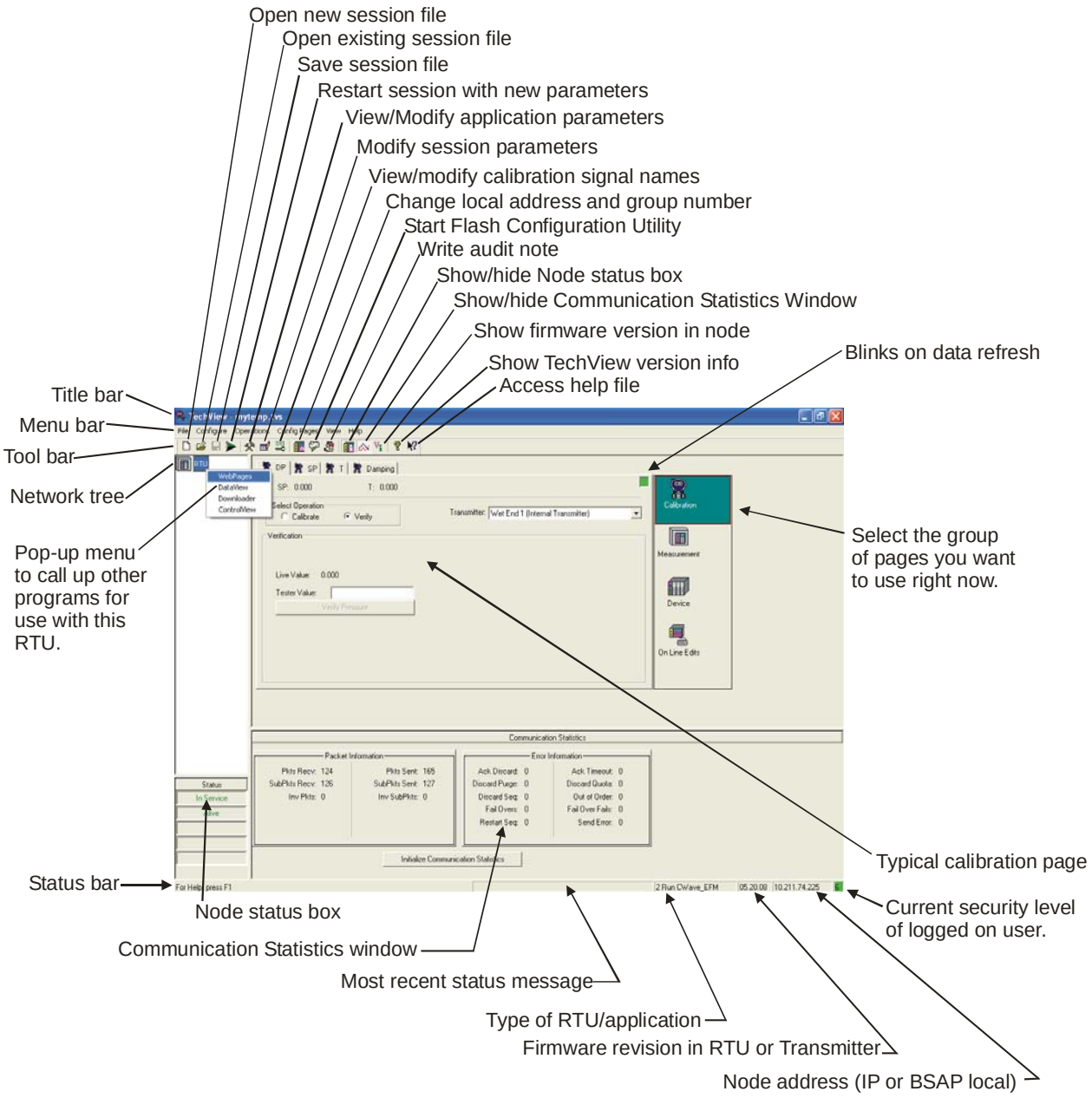

Open new session file
Open existing session file
Save session file
Restart session with new parameters
View/Modify application parameters
Modify session parameters
View/modify calibration signal names
Change local address and group number
Start Flash Configuration Utility
Write audit note
Show/hide Node status box
Show/hide Communication Statistics Window
Show firmware version in node
Show TechView version info
Access help file
Blinks on data refresh
Title bar
Menu bar
Tool bar
Network tree
Pop-up menu to call up other programs for use with this RTU.
Select the group of pages you want to use right now.
Typical calibration page
Status bar
Node status box
Communication Statistics window
Most recent status message
Type of RTU/application
Firmware revision in RTU or Transmitter
Node address (IP or BSAP local)
Current security level of logged on user.

Figure 4-1. TechView Overview

4.1 Changing the Session Parameters You Entered

If you want to change the entries you made in the Communication Setup, Node Setup, or Calibration Setup dialog boxes for this session, click on the icon shown at left, or click on **Configure > Session Parameters**. Enter the new parameters, as desired. After exiting the wizard, the session restarts automatically with the new parameters.

4.2 Restarting the Session

If you change the local address or group number of the RTU, and want to restart the session, click on the icon shown at left. If communication is lost during calibration, you can also use this button to restart communications.

4.3 Saving Your Session File

To save your session file, click on **File > Save Session**, or click on the icon shown at left.

Copying Your Session to Another Session File Name

Click on **File>Save Session As**. The Save Copy As dialog box opens. Enter a name for the second copy of the session file in the **File name** field, and click **Save**. The original session file remains active; the newly named session file will be a copy of the active session file, but will not be running.

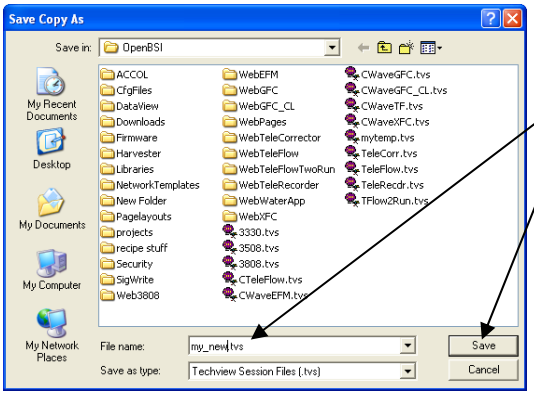


Figure 4-2. Copying a Session

4.4 Application Settings

Note: Unlike session parameters, which are stored in TVS files, and can thereby vary depending upon which session file you have running, application parameters apply to the TechView application itself. Therefore, there is only one set of application parameters that apply no matter what session file you are using

Application Settings determine the choices the user needs to make when TechView first starts. To call up the Application Settings dialog box, click **Configure > Application Settings**, or simply click on the icon, shown at left.

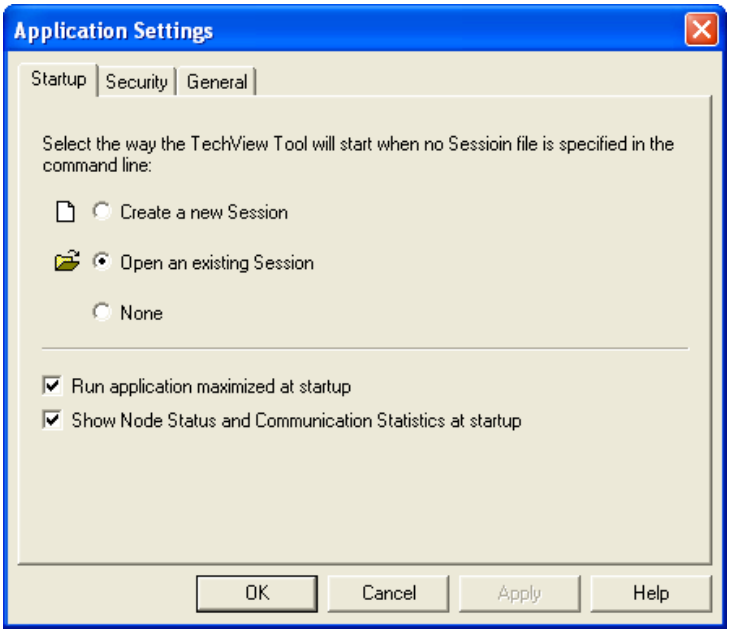


Figure 4-3. Application Settings dialog box – Startup tab

4.4.1 Startup tab

The **Startup** tab specifies the initial prompt a user sees, if a session file is **not** specified via the command line. As discussed, earlier, a *.TVS session file holds certain configuration parameters for how TechView communicates with a controller or transmitter

Field	Description
Create a new Session	If selected, when TechView starts, it prompts the user to provide a name for a new session (or to use the default name of temp.tvs.). This session file holds the communication/ configuration settings you subsequently define.

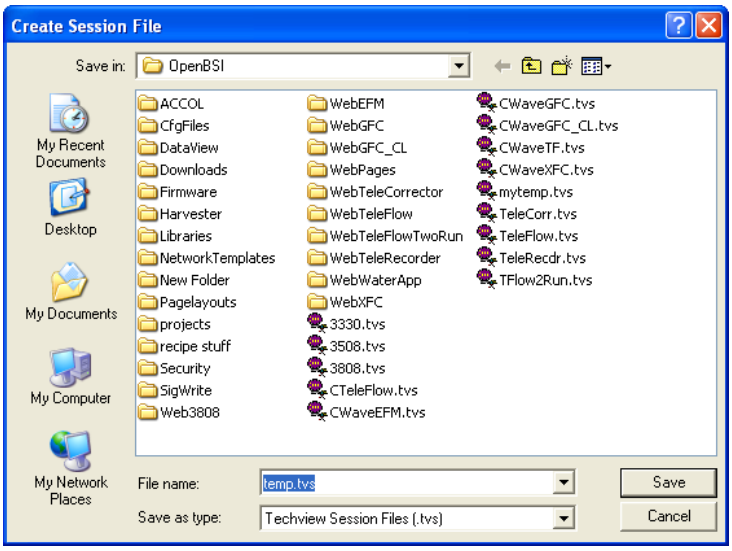


Figure 4-4. Create Session File

Open an existing Session	If selected, when TechView starts, it prompts the user to choose a previously defined session file, which TechView then starts. (Default choice). **Note:**: Only one session can be active at any one time; if you already have a session running, when you try to open a new session file, TechView prompts you to confirm that the *current* session will be closed.

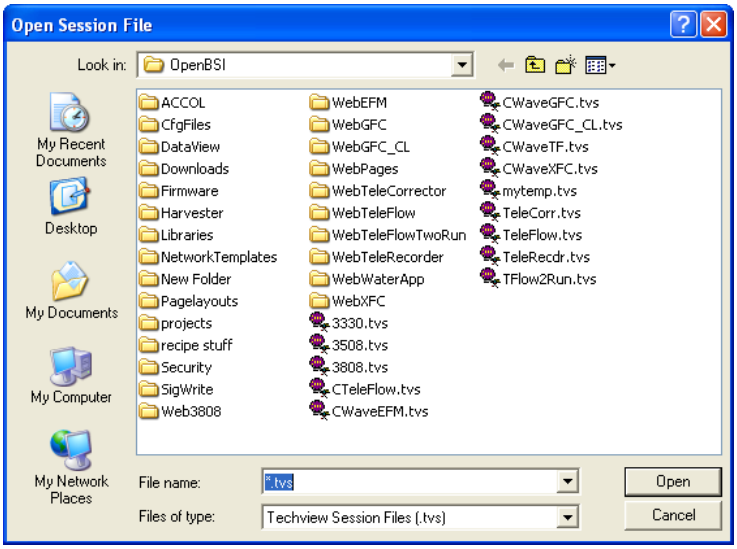


Figure 4-5. Open Session File

None	If selected, no prompt appears initially. The user has two choices:
	The user can choose to manually start a new session by clicking on **File> New Session**, or by clicking on the icon shown at left
	The user can choose to open a previously defined session by clicking on **File > Open Session**, or by clicking on the icon shown at left, and then selecting

	the appropriate *.TVS file
Run application maximized at startup	If checked, when the TechView application starts, it fills the available screen space on your PC monitor
Show Node Status and Communication Statistics at startup	If checked, displays the Node Status box, and the Communication Statistics window. **Note**: These items can be shown/hidden after startup is completed

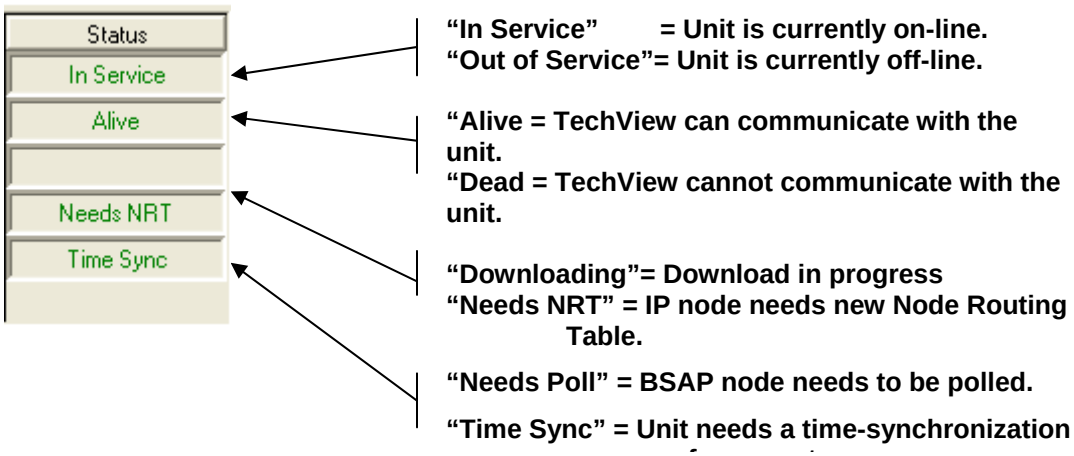

Status
In Service
Alive
Needs NRT
Time Sync
"In Service" = Unit is currently on-line.
"Out of Service"= Unit is currently off-line.
"Alive = TechView can communicate with the unit.
"Dead = TechView cannot communicate with the unit.
"Downloading"= Download in progress
"Needs NRT" = IP node needs new Node Routing Table.
"Needs Poll" = BSAP node needs to be polled.
"Time Sync" = Unit needs a time-synchronization

Figure 4-6. Node Status Box

To show/hide the Node Status box, click **View** > **Node Status** or click on the icon shown at left.

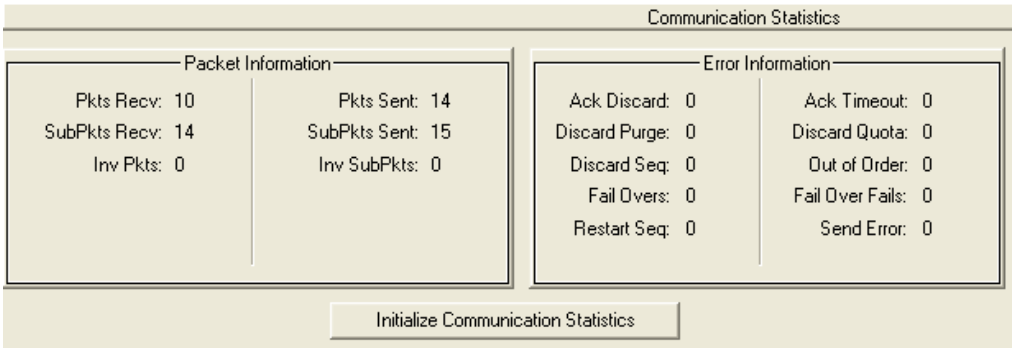


Figure 4-7. Communication Statistics window

To show/hide the Communication Statistics window, click on **View** > **Comm Statistics** or click on the icon shown at left.

4.4.2 Security tab

The **Security** tab allows you to optionally set up a default username/password combination that TechView uses to log onto any RTU in your network. For this to work, each RTU you want to communicate with must have this same username/password combination defined locally.

Note: Beginning with OpenBSI 5.8 Service Pack 1, passwords can include up to 16 characters; previous versions were limited to six characters.

The Security tab also allows you to set a timeout (in seconds) for successfully logging in or out of web pages.

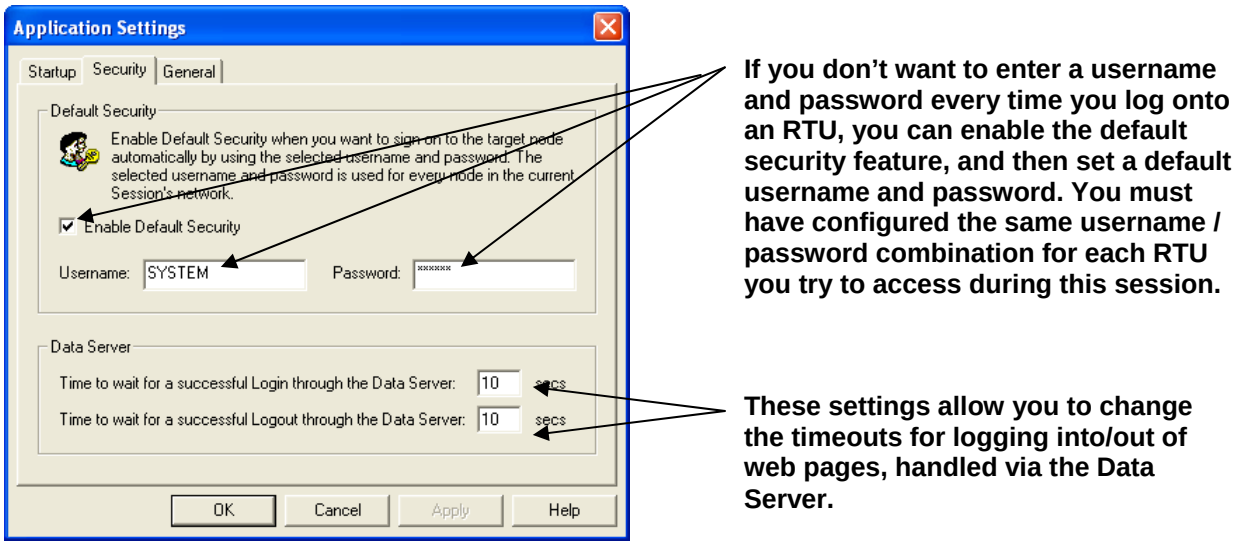

Application Settings
Startup
Security
General
Default Security
Enable Default Security when you want to sign-on to the target node automatically by using the selected username and password. The selected username and password is used for every node in the current Session's network.
Enable Default Security
Username:
SYSTEM
Password:
******
Data Server
Time to wait for a successful Login through the Data Server:
10
secs
Time to wait for a successful Logout through the Data Server:
10
secs
OK
Cancel
Apply
Help
If you don't want to enter a username and password every time you log onto an RTU, you can enable the default security feature, and then set a default username and password. You must have configured the same username / password combination for each RTU you try to access during this session.
These settings allow you to change the timeouts for logging into/out of web pages, handled via the Data Server.

Figure 4-8. Application Settings dialog box – Security tab

4.4.3 General tab

On the **General** tab you can specify whether or not you want the Advanced Interface Setup File detection dialog box to prompt you when AISF files already exist on the PC, and would be overwritten by files from the RTU. To disable this prompt, un-check the **Show Advanced Interface Setup File Detection Dialog** option.

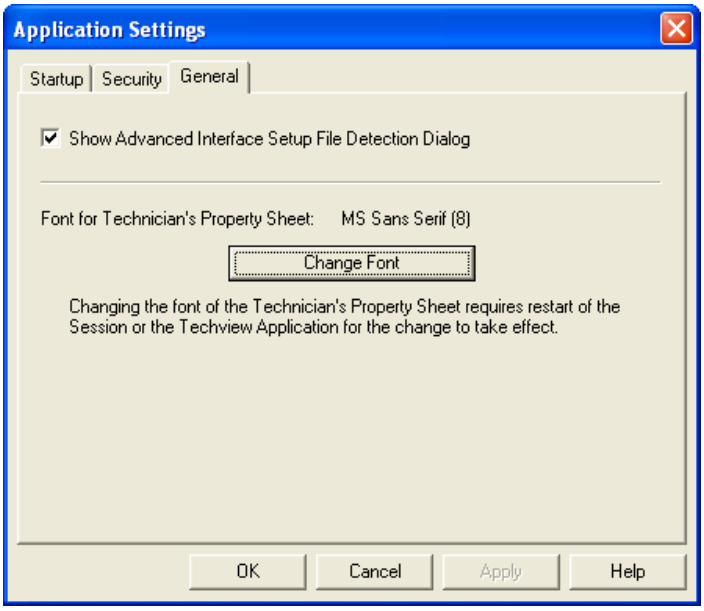

Application Settings
Startup
Security
General
Show Advanced Interface Setup File Detection Dialog
Font for Technician's Property Sheet: MS Sans Serif (8)
Change Font
Changing the font of the Technician's Property Sheet requires restart of the Session or the Techview Application for the change to take effect.
OK
Cancel
Apply
Help

Figure 4-9. Application Settings dialog box – General tab

You can also use the **Change Font** button to change the font used in properties pages from the default of MS-San Serif – 8 point.

The change of font takes effect once the application or session is re-started. You can change the point size of text immediately by clicking **View > Small Fonts, View> Medium Fonts** or **View > Large Fonts**.

Note: Bolding or larger point sizes may result in text that cannot fit on pages and so cannot be read. Verify your changes to ensure readability.

4.5 Calibration and Verification Signals

If you modify a standard application (pre-made ACCOL load or ControlWave project that shipped from the factory with your unit), and as part of that modification, change the signal names used for calibration, verification, live values, etc., you must identify the new signal names, within TechView, otherwise calibration and verification operations will **not** function properly. To do this, you must call up the associated Calibration, or Verification signals dialog box.

To call up configuration signals, click **Configure > Calibration Signals** or click the **Calibration Signal Configuration** button located in the Calibration Setup page of the Session Parameters wizard. You can also click the icon shown above.

To call up verification signals, click **Configure > As Found / As Left Verification Signals** or click on the **As Found / As Left Signal Configuration** button located in the Calibration Setup page of the Session Parameters wizard.

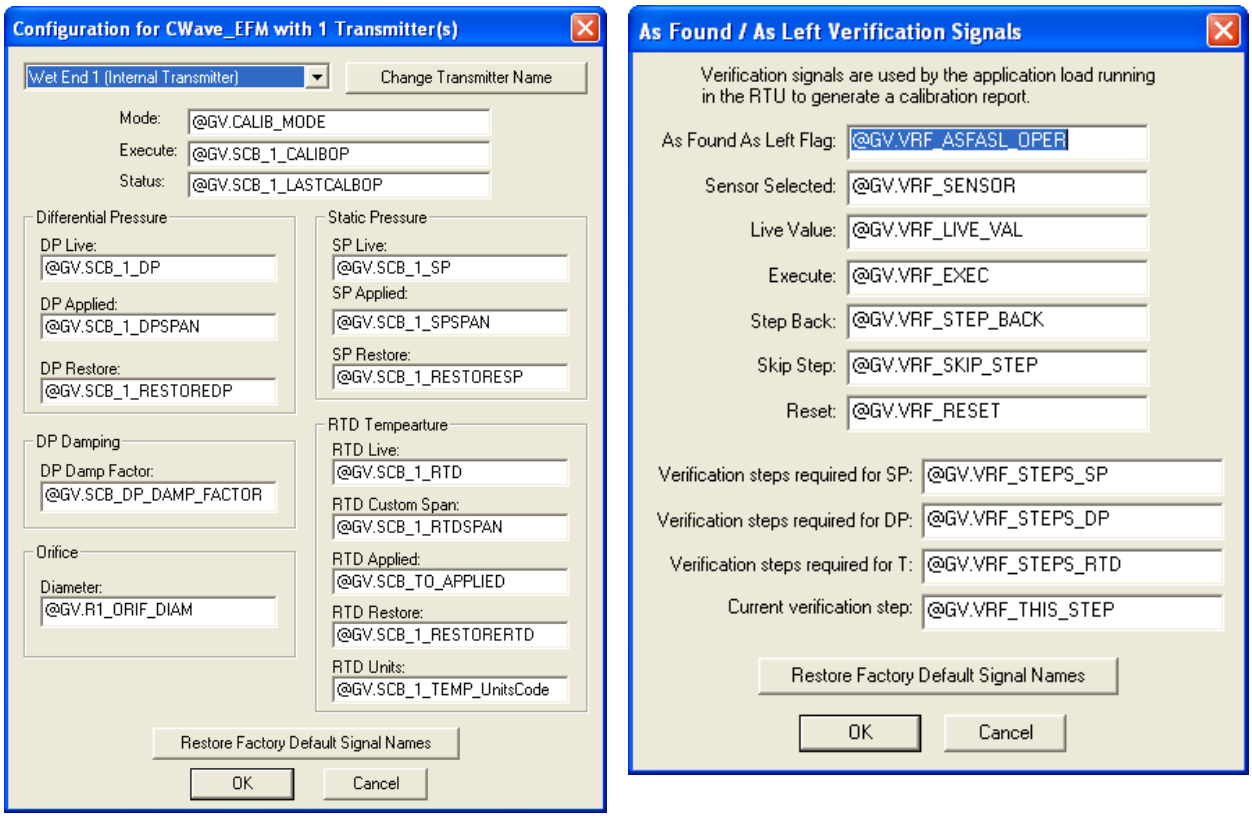


Figure 4-10. Modifying Calibration Signal Names

Note: The dialog box appears different depending upon which RTU platform and application you are modifying.

Be sure, when specifying calibration signals, that you first select the correct transmitter, meter run and/or application.

4.5.1 Extended Verification

If you are using the extended verification feature (OpenBSI 5.8 Service Pack 2 and newer) which allow audit logging of Modbus messages for verification of zero and span, and you change the names of verification variables used in the application, you must specify the new names as well.

To call up the Extended Verification Signals dialog box, click **Configure > Extended Verification Signals** or click on the **Extended Verification Signal Configuration** button located in the Calibration Setup page of the Session Parameters wizard.

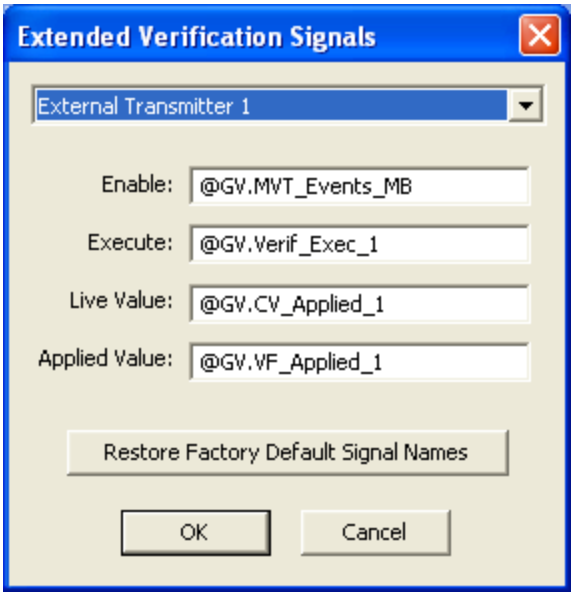


Figure 4-11. Extended Verification Signals dialog box

The table, below, describes the functions of each of the variables. Change the names as required, and click **OK**.

If, at any time you need to restore the default variable names, call up the dialog box and click the **Restore Factory Default Signal Names** button, then click **OK**.

Table 4-1. Default Variable Names for Extended Verification

Default Variable Name	Data Type	Description
@GV.MVT_Events_MB	BOOL	Set to TRUE to enable the extended verification feature. TechView only enables extended verification when this variable is defined; if the default variable name or a substitute name you specify does not exist in the application, the extended verification feature is disabled.
@GV.VF_Applied_*x*	REAL	TechView stores the verification (tester) value the user enters here. The *x* refers to the external transmitter number.
@GV.CV_Applied_*x*	REAL	TechView stores the actual live value read from the process variable in the transmitter here. The *x* refers to the external transmitter number.
@GV.Verif_Exec_*x*	INTEGER	This field shows an execution code when the applied variables are updated. These codes are: 1 = Verify DP Zero 2 = Verify DP Span 3 = Verify SP Zero 4 = Verify SP Span 5 = Verify T Zero 6 = Verify T Span **Note:** The application programmer is responsible for resetting this value to 0 after the code is read.

4.5.2 Changing the Name of a Transmitter

To change the name displayed for a particular transmitter, click the **Change Transmitter Name** button and type in a new name for the transmitter. If you decide you don't want to change the name, *prior to pressing* **Enter** press **Esc**.

Figure 4-12. Changing the Name of a Transmitter

If you make a mistake, and want to change signal names back to the original names from the standard application, click **Restore Factory Default Signal Names**.

This feature requires OpenBSI 5.8 (or newer).

4.6 Changing the Local Address / Group Number

For those RTUs in which the local address is stored in FLASH (ControlWave-series, TeleFlow-series) TechView can change the local address of the unit, and simultaneously change the local address for this session so communications will continue. The session is temporarily suspended while this change is occurring.

By default, the Group Number is always set to 0, however, if you are using Expanded Node Addressing (EBSAP) you may assign different group numbers. Note, however, that once you have changed the group number, you must drag the icon for the node in the NetView tree so that it is underneath the correct virtual node.

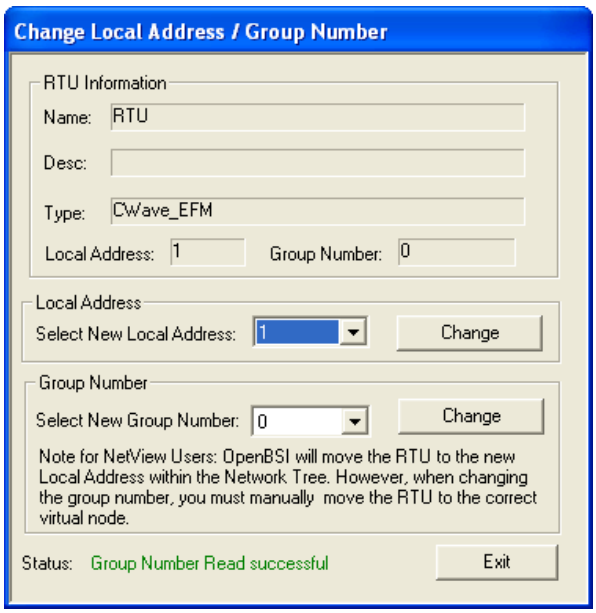

Change Local Address / Group Number
RTU Information
Name: RTU
Desc:
Type: CWave_EFM
Local Address: 1
Group Number: 0
Local Address
Select New Local Address: 1
Change
Group Number
Select New Group Number: 0
Change
Note for NetView Users: OpenBSI will move the RTU to the new Local Address within the Network Tree. However, when changing the group number, you must manually move the RTU to the correct virtual node.
Status: Group Number Read successful
Exit

Figure 4-13. Changing the Local Address / Group Number

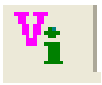
To change the local address or group number, use the list boxes provided, then click on the associated **Change** button.

Note: The change local address and change group number functions for ControlWave require 04.60 or newer system firmware

4.6.1 Starting the Flash Configuration Utility

The Flash Configuration utility allows configuration of soft switches, ports, IP parameters, and for ControlWave-series units, additional parameters, as well. To start the Flash Configuration utility, click **Operations > Access Flash Parameters**, or click on the icon, shown at left. For information on the Flash Configuration utility, see the *Chapter 5* of the *OpenBSI Utilities Manual* (document# D5081).

4.6.2 Show Firmware Version in Node



To find out the version of system firmware within the RTU, click on **View > Version Information**, or click on the icon shown at left

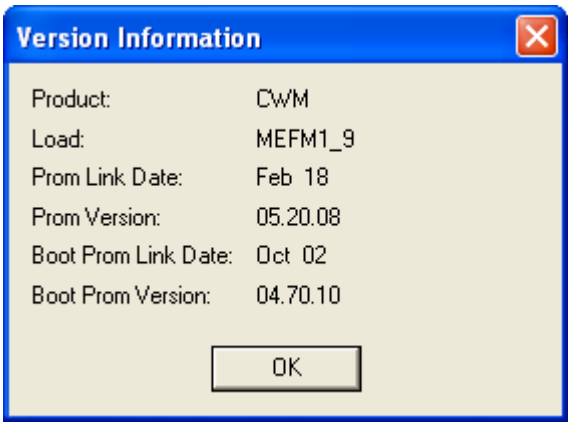


Figure 4-14. Version Information dialog box

4.6.3 Writing an Audit Note

The Audit system configured in a ControlWave RTU's AUDIT function block maintains a history of certain system events and alarms. In addition, beginning with TechView, it is possible to have an operator or technician send their own audit note to be stored in the RTU.

To send an audit note to the RTU, type the text in the box (up to 37 characters), then click on the **Send** button. TechView adds the note to the audit file, with a timestamp.

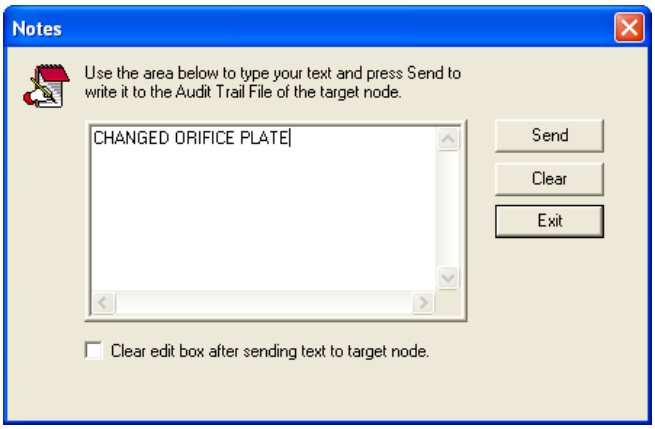

Notes
Use the area below to type your text and press Send to write it to the Audit Trail File of the target node.
CHANGED ORIFICE PLATE
Send
Clear
Exit
Clear edit box after sending text to target node.

Figure 4-15. Notes dialog box

To close the Notes dialog box, click **Exit**.

4.6.4 Viewing OpenBSI Workstation Communication Statistics

In addition to RTU communication statistics which may be displayed at the bottom of TechView screens, you can optionally view OpenBSI workstation communication statistics. To see these, click **View > OpenBSI Processes** from the menu bar.

For information on what the various statistics mean, see *Chapter 6* of the *OpenBSI Utilities Manual* (D5081).

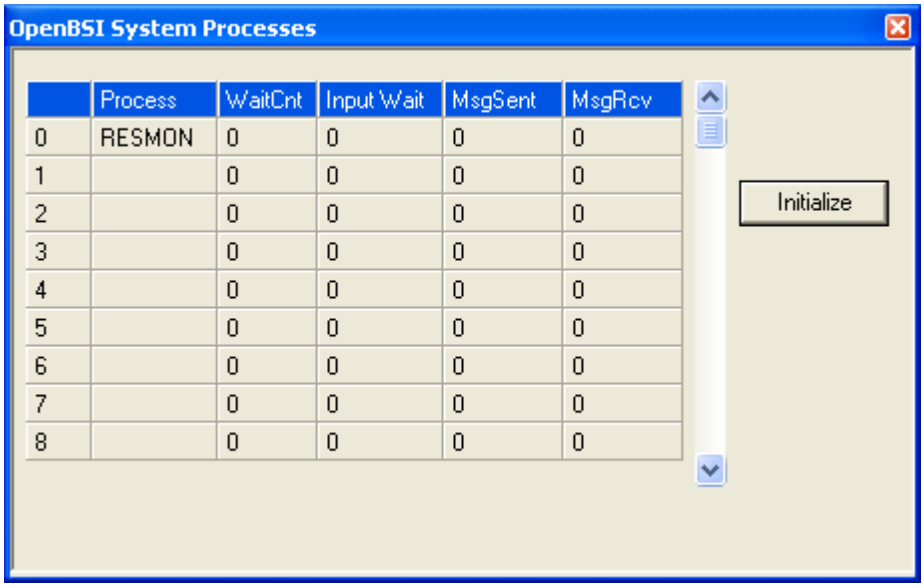


Figure 4-16. OpenBSI System Processes

4.6.5 Deleting Historical Files from the RTU (Clear History)

A ControlWave-series controller stores archive files of historical data, and audit records of significant system events. Normally, the Harvester, or some other program periodically collects this data for export to

OpenEnterprise or a third-party package, and eventually new data overwrites the existing data.

If, however, you want to permanently delete audit or archive data residing in the ControlWave, you can use the Clear History function.

Note: The ControlWave-series controller must have 04.80 or newer firmware to use this function. This operation requires OpenBSI 5.7 or newer.

Caution **If there should be a power failure to the ControlWave during the "Clear History" operation, files will not delete properly.**

Caution **If you want to save any Audit or Archive data, you must do this before you use the Clear History function.**

We also recommend you save your current historical configuration to an FCP file prior to deleting audit or archive files, so that you can restore the structure (though not the data), if a failure occurs.

1. To delete historical data, click **Operations > Clear History**.
2. The Clear RTU History dialog box opens.

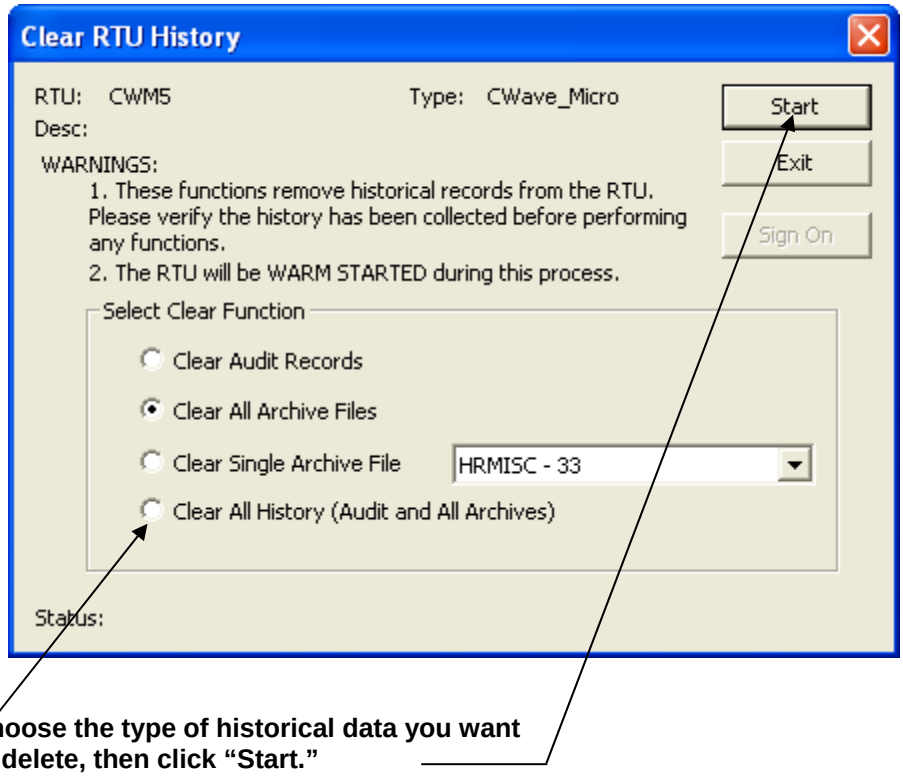

Clear RTU History
RTU: CWM5
Type: CWave_Micro
Desc:
Start
Exit
Sign On
WARNINGS:
1. These functions remove historical records from the RTU. Please verify the history has been collected before performing any functions.
2. The RTU will be WARM STARTED during this process.
Select Clear Function
Clear Audit Records
Clear All Archive Files
Clear Single Archive File
HRMISC - 33
Clear All History (Audit and All Archives)
Status:
Choose the type of historical data you want to delete, then click "Start."

Figure 4-17. Deleting Historical Data

3. You have four possible choices on what to delete. See explanations for the fields, below.

Field	Description
Clear Audit Records	This choice deletes all Audit records residing in the ControlWave.
Clear All Archive Files	This choice deletes all Archive Files residing in the ControlWave.
Clear Single Archive File	This choice deletes a single Archive File. When choosing this, use the list box to specify which Archive File you want to delete.
Clear All History (Audit and All Archives)	This choice deletes all Audit Records and all Archive Files.

4. After you make your choice, click **OK** to proceed with the deletions, or **Cancel** to abort the operation. After you click **OK** TechView gives you a warning prompt and asks you to confirm that you want to perform the deletions.

Caution **Once you click OK to the deletion confirmation prompt, there is no way to reverse the deletion operation; the delete command removes the chosen files from the unit and the unit re-boots twice to accomplish the deletion operation.**

Note: If you see the status message *Not enough memory to complete parameter setting*, it means the flash memory area is full and the deletion could not be completed because files are shifted during the deletion. If this occurs during the Clear All History operation, try clearing audit files first, then clear archives; if this doesn't resolve the issue, use the Flash File Access tool to delete individual files and free up space. See the *ControlWave Designer Programmer's Handbook* (D5125) for information on the Flash File Access tool.

Chapter 5 – Calibration Overview

This chapter provides general information on calibration and then provides procedures for calibrating different devices.

In This Chapter

5.1 Why is Calibration Necessary?....5-1
5.2 Calibration Concepts....5-1
5.3 Before You Begin....5-3
5.4 Equipment Required for Calibration....5-5
5.4.1 Equipment Required For Pressure Calibration....5-5
5.4.2 Equipment Required For Temperature Calibration....5-7
5.4.3 Equipment Required for Analog Output Calibration (3808 only)....5-7
5.4.4 Entering Calibration Mode / Leaving Calibration Mode....5-7

5.1 Why is Calibration Necessary?

When a transmitter ships from the factory, it is already factory-compensated for a specific pressure range. When you install the transmitter on site, however, the accuracy of the transmitter may have been affected by environmental conditions (temperatures, atmospheric pressures, etc.) at that particular site. For this reason you must calibrate the transmitter. In addition, you must periodically re-calibrate the transmitter to ensure that it maintains its accuracy.

5.2 Calibration Concepts

You must understand certain concepts and terminology before performing the calibration procedures:

Measured Variable

The measured variable is the actual "live" process variable reading, coming from the transmitter. This could be a differential/gage pressure reading, a static pressure reading, or a resistance temperature detector (RTD) temperature reading.

Applied Value

Applied values are used during calibration. They represent known values, which are used as a standard or benchmark from which other values can be calculated by the transmitter.

For pressure, the applied value is a *known* pressure, applied from an external pressure source, to the transmitter.

For temperature, the applied value is a *known* resistance applied by the user, by connecting a resistor, in place of the RTD.

Upper Range Limit (URL) and Lower Range Limit (LRL)

Transmitters are ordered with specific pressure ranges. An upper range limit (**URL**) and a lower range limit (**LRL**) are preset at the factory to define the range of pressures that the transmitter can

read. The URL is the maximum value for the pressure, which can be read by the transmitter. The LRL is the minimum value for the pressure, which can be read by the transmitter. Any pressure value which is higher than 105% of the value of the URL or lower than the value of (LRL -(5% of the URL)) is considered out-of-range and cannot be considered accurate.

Upper Range Value (URV) and Lower Range Value (LRV)

(applies to analog models only)

In contrast to the URL and LRL which define the fixed, pre-defined factory range for the transmitter, the Upper Range Value (URV) and Lower Range Value (LRV) may be used to establish the range being measured for the actual process. For example, suppose the transmitter has an LRL of 0 psi, which corresponds to 4 mA and a URL of 1000 psi, which corresponds to 20 mA, but the range of values you want to measure is 0 to 500 psi, then the LRV would be 0 (4 mA) and the URV would be 500 (20 mA).In this example, the LRV and URV settings represent a 2 to 1 turndown.

There are certain rules to be observed when setting LRV and URV.

The LRV cannot be set below the LRL.
The URV cannot be set above the URL.
URV minus LRV must be greater than 1/20 of the URL.

For more information on LRV/URV, please consult the hardware documentation for the transmitter.

SPAN

The SPAN value is a positive value which (*when added to the ZERO value*) defines the highest expected operational value for a particular measured variable. This *could* be the same as the URL, but in some cases, the SPAN value might not equal the URL. For example, a transmitter having a 2000 psi URL might only be used over a 0 to 1000 psi range, and so a span calibration at the 1000 psi point is performed. The minimum value for the span is URL divided by 20. If, when calibrating the SPAN value for a pressure transducer, you apply a pressure value significantly less than the URL, accuracy may be reduced for readings outside of the span.

ZERO

The ZERO value is the measured variable value that corresponds to 0% of the transmitter's SPAN, i.e. 4 mA for a 4 to 20 mA range, or 1V for a 1 to 5V range.

MVT

Multi-variable transducer.

RTD

Resistance Temperature Detector

GPT

Gage Pressure Transducer

Verification

This is a periodic check in which you compare the live reading of a transmitter against a known measurement standard in order to

determine if the transmitter measures accurately and remains properly calibrated. You apply an external source, such as a dead-weight tester, to the transmitter and check points along the measurement curve.

Damping

The output damping feature is applicable to ControlWave EFM/GFC/XFC flow/gas computers, 3508-series Transmitters and 3808-series Transmitters and controls the rate at which the output responds to a given change of input. It is used to slow down the output response to a rapid or oscillatory change of the measured variable.

Damping Time

The period of time during which the indicated value changes only 63% of the difference between the "present measured variable" and the "present indicated pressure" in one damping time period. It would take 5 times the DP Floating Point Damping Time for the "present indicated pressure" to equal the "present measured pressure" (if a change in the "present measured pressure" didn't occur). An increase in the DP Floating Point Damping Time results in an increased smoothing of the indicated value. **Note:** In the case of a model 3530-series unit, if the External Transmitter is a model 3808, Damping Mode is always enabled and can't be changed; Damping Time can't be changed either.

As Found / As Left

(OpenBSI 5.8 and newer)

"As Found/As Left" verification is a systematic method to capture the state of a transmitter, both before and after linearization or calibration of the transmitter.

At the start of the process, you perform the "As Found" verification. This determines the current state of the transmitter.

You evaluate the results against a set of limits to determine whether you need to:

a) leave the transmitter as is

b) perform a physical calibration of the transmitter or

c) take the transmitter out of service and replace it.

You can compare the results to values from the previous "As Left" verification.

Note: As Found/As Left operations are logged in the audit buffer at the RTU.

5.3 Before You Begin

Before you start the calibration procedure, there are several things you need to be aware of.

Calibration in the lab vs. calibration on site

Although it is more convenient and recommended to perform this procedure using a laboratory setup, calibration can also be performed

on site providing that the connecting line or flange is equipped with a calibration tap and appropriate shutoff and bypass valves. This added equipment allows you to feed in an external test pressure source or use the process pressure as a reference signal. In the latter setup, the valves are closed to seal a fixed pressure in the connecting line.

Note: Before starting any calibration procedures, make sure that the unit in question is firmly anchored in its intended operating position. A different mounting position can affect zero calibration for some ranges and necessitate re-calibration.

⚠ WARNING

Only perform calibration activities if the area is non-hazardous.

Before attempting on-site calibration, carefully check the application. If the unit in question is operated in a closed control loop configuration, either the MVT/GPT Pressure Transducer must be isolated from the process, or the process must be turned off. If this is not done, a critical process could accidentally be driven into a dangerous region causing damage to equipment and property, and injury to persons

Note: If you modified your application to use different calibration / verification signal names, you must identify these within TechView. See *Section 4.5*.

Communication Port Considerations

Notes:

- When performing calibration in the field for a Network 3000 device, use the Pseudo-Slave Port of the RTU, not the Slave Port. Connecting through the Slave port would force you to break communications with upper levels of the network. In addition, if you use the Slave Port, it would receive a node routing table (NRT) from TechView which would only encompass the locally connected node, and its transmitters. When the connection is subsequently restored with the network, this would be an incorrect node routing table, and communications would still not be possible with higher level nodes. To avoid these problems, perform calibration through a Pseudo-Slave Port.
- When performing calibration through a ControlWave unit's port, you must set its _Px_NRT_DIS system variable to TRUE to avoid the same problem described above.
- When performing calibration through a ControlWave unit's port, you must set its _Px_NRT_DIS system variable to TRUE to avoid the same problem described above.
- If you are using Expanded Node Addressing (EBSAP) with ControlWave, and the ControlWave unit is in a group other than Group 0, the Local Port MUST be marked as LOCAL via the System Variable Wizard in ControlWave Designer. Otherwise, communications will not be possible.

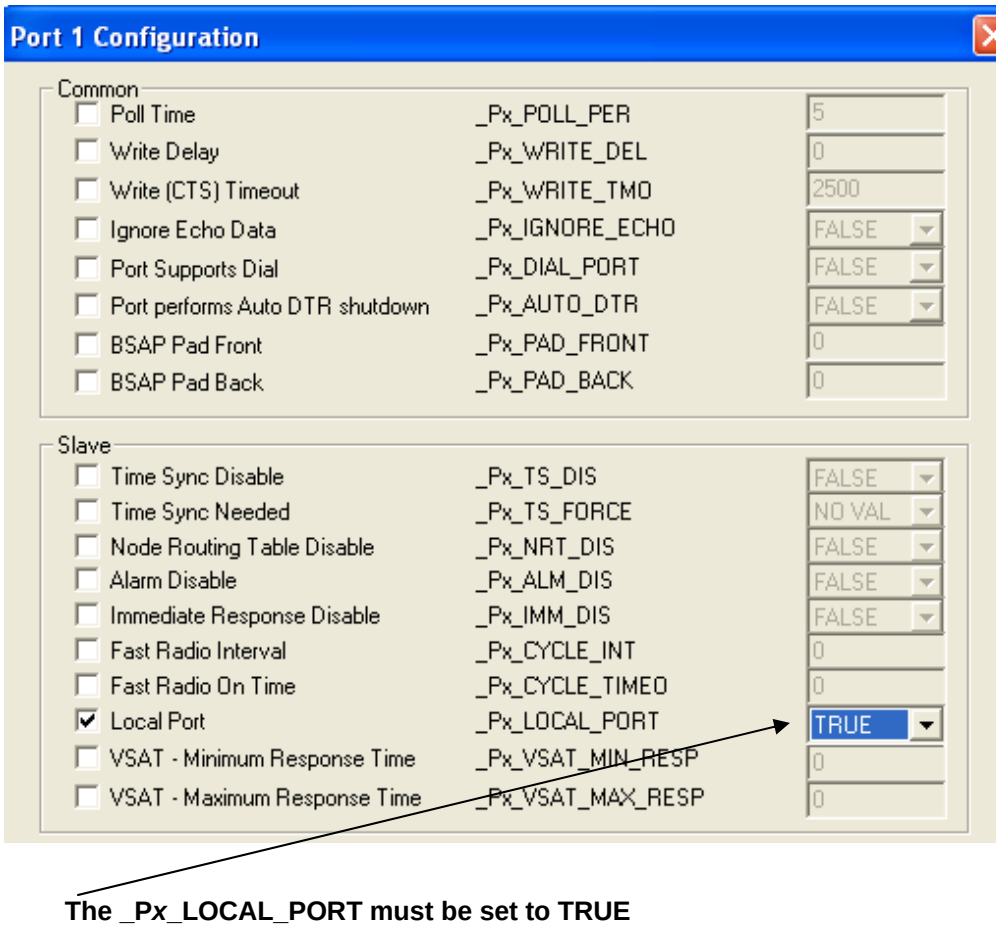

Port 1 Configuration
Common
Poll Time _Px_POLL_PER 5
Write Delay _Px_WRITE_DEL 0
Write (CTS) Timeout _Px_WRITE_TMO 2500
Ignore Echo Data _Px_IGNORE_ECHO FALSE
Port Supports Dial _Px_DIAL_PORT FALSE
Port performs Auto DTR shutdown _Px_AUTO_DTR FALSE
BSAP Pad Front _Px_PAD_FRONT 0
BSAP Pad Back _Px_PAD_BACK 0
Slave
Time Sync Disable _Px_TS_DIS FALSE
Time Sync Needed _Px_TS_FORCE NO VAL
Node Routing Table Disable _Px_NRT_DIS FALSE
Alarm Disable _Px_ALM_DIS FALSE
Immediate Response Disable _Px_IMM_DIS FALSE
Fast Radio Interval _Px_CYCLE_INT 0
Fast Radio On Time _Px_CYCLE_TIMEO 0
Local Port _Px_LOCAL_PORT TRUE
VSAT - Minimum Response Time _Px_VSAT_MIN_RESP 0
VSAT - Maximum Response Time _Px_VSAT_MAX_RESP 0
The _Px_LOCAL_PORT must be set to TRUE

Figure 5-1. Identifying the Local Port

5.4 Equipment Required for Calibration

The equipment required depends on what type of calibration you need to perform.

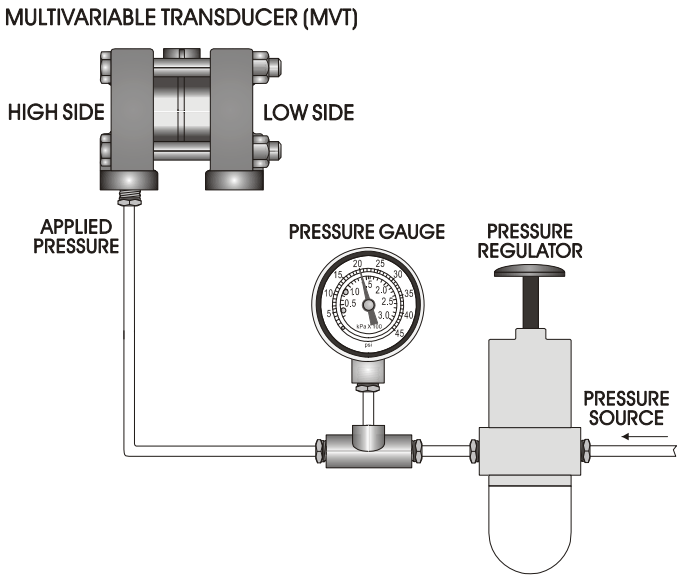
5.4.1 Equipment Required For Pressure Calibration

Pressure calibration (static, differential or gage) requires the following items:

- Instrument Mounting Fixture: This fixture must secure the instrument such that the MVT is positioned identically to its installation site. GPT equipped units must be positioned vertically.
- A Pressure Gauge (must cover the range of the MVT/GPT Transducer ±.025% accuracy)
- An adequate Pressure Regulator
- A Pressure Source (and Interconnect Lines) capable of generating fixed pressure values equivalent to 0%, and 100% values of transmitter's range (URL).

The pressure calibration procedures in this manual require that a text fixture incorporating these items be used.

A typical MVT pressure calibration interconnection diagram is shown, below:



Note: For static pressure calibration setup, connect an identical supply pressure to the low side port of the MVT.

- *Figure 5-2. Typical Setup for MVT Calibration*

A typical gage pressure calibration interconnection diagram is shown, below:

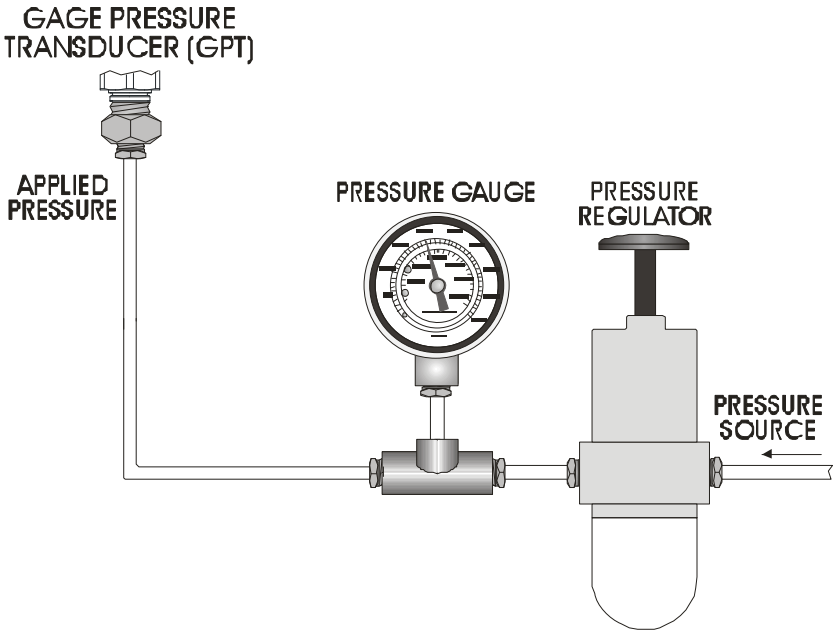


Figure 5-3. Typical Calibration Setup of GPT Using Test Pressure

5.4.2 Equipment Required For Temperature Calibration

Caution

In order to calibrate the RTD Temperature properly, you must have a resistor with accuracy of ±0.01% accuracy or better. Otherwise: you could actually make the RTD *calibration less accurate* than it was prior to your calibration/verification. For example, with a ±0.1% resistor, a temperature reading could be off 0.25 degrees C at 100 ohms, and 0.9 degrees C at 300 ohms. Factory calibration accuracy is ±0.05°C at 100°C (212°F) and ±0.30°C at 300°C (572°F).

RTD Calibration Resistors

R_{zero} = 100.00Ω, ±0.01%, 1/4W (0°C = +32°F)

$R_{20\%Scale}$ = 140.23Ω, ±0.01%, 1/4W (104.55°C = +220°F)

$R_{40\%Scale}$ = 180.57Ω, ±0.01%, 1/4W (212.85°C = +415°F)

$R_{50\%Scale}$ = 200.01Ω, ±0.01%, 1/4W (266.38°C = +511°F)

$R_{60\%Scale}$ = 220.12Ω, ±0.01%, 1/4W (322.74°C = +613°F)

$R_{80\%Scale}$ = 260.22Ω, ±0.01%, 1/4W (438.34°C = +821°F)

R_{span} = 300.00Ω, ±0.01%, 1/4W (+557.69°C = +1035.84°F)

5.4.3 Equipment Required for Analog Output Calibration (3808 only)

Analog output calibration requires:

- electrical supply source: +5Vdc (Min.), +42Vdc (Max.) – powers the transmitter
- digital multimeter (DMM) or ammeter with a 5-1/2 digit scale ±(.005% accuracy)
- Transmitter Interface Unit (Part No. 389959-01-4)
- 250-ohm resistor (±.01%, 1/4 watt)

5.4.4 Entering Calibration Mode / Leaving Calibration Mode

You enter calibration mode by clicking on the **Calibration** icon on the right hand side of the screen.

.

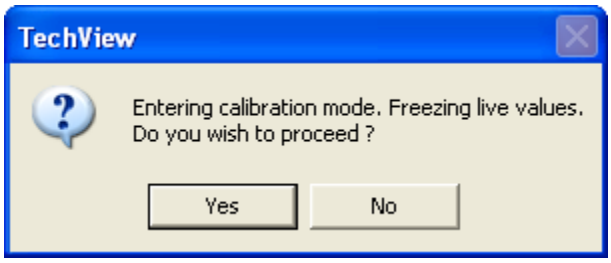


Figure 5-4. Entering Calibration Mode

When you enter calibration mode, live values for differential pressure, static pressure, gage pressure, and temperature are frozen (i.e. the RTU will collect no new values from the transmitter, during calibration mode.) By default, you'll see a prompt warning you of this and giving you the option of **not** entering calibration mode. Click **Yes** to enter calibration mode.

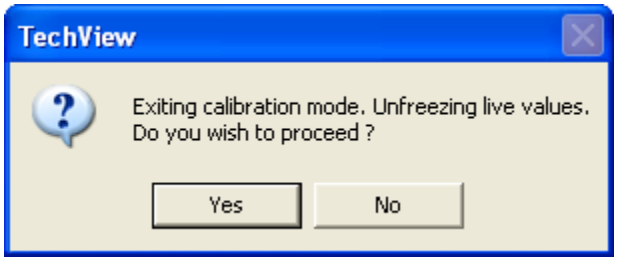


Figure 5-5. Exiting Calibration Mode

Similarly, by default, when you click on a different group icon to exit calibration mode, you'll see a prompt asking you to confirm that you want to exit calibration mode, thereby unfreezing live values. Click **Yes** to exit calibration mode.

Note: You can disable these confirmation prompts in the Calibration Setup session parameters dialog box.

Chapter 6 – Calibrating the 3508 series TeleTrans Transmitter

This chapter covers calibration activities for the Bristol 3508-series TeleTrans transmitter.

For a general overview of calibration concepts, see *Chapter 5*.

For instructions on starting calibration mode, see *Section 5.4.4*.

In This Chapter

6.1 Calibration of Differential/Gage Pressure 6-1
6.2 Calibration of Static Pressure 6-3
6.3 Calibration of RTD Temperature.....6-5

6.1 Calibration of Differential/Gage Pressure

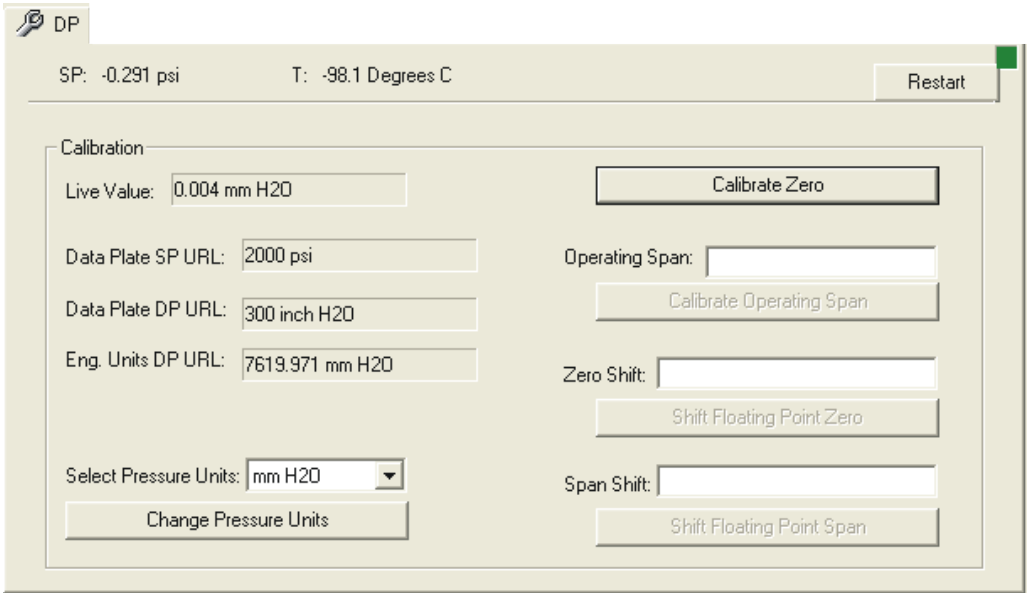


Figure 6-1. DP Tab – Calibrating Differential/Gage Pressure

Calibrating Zero and Span

1. To calibrate the zero, vent the transmitter to atmosphere, so no differential pressure is applied. Click **Calibrate Zero** and the **Live Value** will be trimmed to be as close to the zero as possible.
2. To calibrate the span, enter the desired span in the **Operating Span** field, then apply a pressure equivalent to the desired span. This value must be less than or equal to the **Data Plate DP URL** value. Then click **Calibrate Operating Span**. The **Live Value** will be trimmed to be as close to the desired span, as possible.

Shifting the DP/GP Floating Point Number

If needed, the span and zero of the DP/GP floating point number may be shifted a minor amount (±3% of URL) so that it correlates with the pressure standard. A correction is achieved by calculating a shift

correction factor and applying it to the floating point number by direct entry.

1. Compare the floating point values in the **Live Value** field with the pressure standard. Choose values at, or close to, zero and the URV. If the zero pressure reading is offset from zero, proceed to step 2. However, if the zero readings agree but an offset occurs at the upper end of the range, proceed to step 4.
2. Calculate the amount of ZERO shift necessary to correlate the floating point number with the external reading as described in the following example, and enter it in the **Zero Shift** field.

   Example*:* Assume that a DP Transmitter with a 300 inH2O URL has been properly calibrated for a 0 to 100 inH2O range. If the external device reads 1.400, the difference is: 0 - 1.400 = -1.400 = -1.400. A **Zero Shift** entry of -1.4 would provide correlation between the floating point number and the external device. **Note*:*** Always set the zero before attempting span calibration. Any zero errors result in an equivalent span offset that complicates calibration.
3. Click **Shift Floating Point Zero.** The adjusted value will appear in the **Live Value** field. If an error occurs, proceed to step 6.
4. Calculate the amount of SPAN shift necessary to correlate the floating point number with the external reading at the upper end of the range (this assumes that zero was previously calibrated as noted above). Use the following example as a guide then enter the value in the **Span Shift** field.

   Example*:* Assume that the URL of the transmitter is 300 inH2O and that the calibrated range is 0 to 100 inH2O. If the external device reads 0.000 and 99.125 inH2O for equivalent DP/GP floating point readings of 0.000 and 100.000 inH2O, the difference would be 100.000 - 99.125 = 0.875. The required span shift entry would be calculated as follows:

   Span Shift = ($\pm$inH2O error) URL/URV = (+0.875) 300/100 = +2.625 inH2O
5. Click **Shift Floating Point Span.** The adjusted value will appear in the **Live Value** field. If an error occurs, proceed to step 6.
6. If the error message "Correction not allowed, change exceeds $\pm$3% of URL" appears, the problem may be caused by: a) the pressure source is not accurate; b) an incorrect value was entered; or c) the zero pressure point was not set accurately. Check out each item and make corrections as required.

Changing the Pressure Units

Select the pressure units for the transmitter, from the **Select Pressure Units** list box, then click the **Change Pressure Units** button.

Note: To force a refresh after changing pressure units, click the **Restart** button.

6.2 Calibration of Static Pressure

For static pressure, the same pressure must be applied to both the HI and LO inputs of the transmitter, thus producing a zero differential across the HI and LO ports, and a SP value at the HI port.

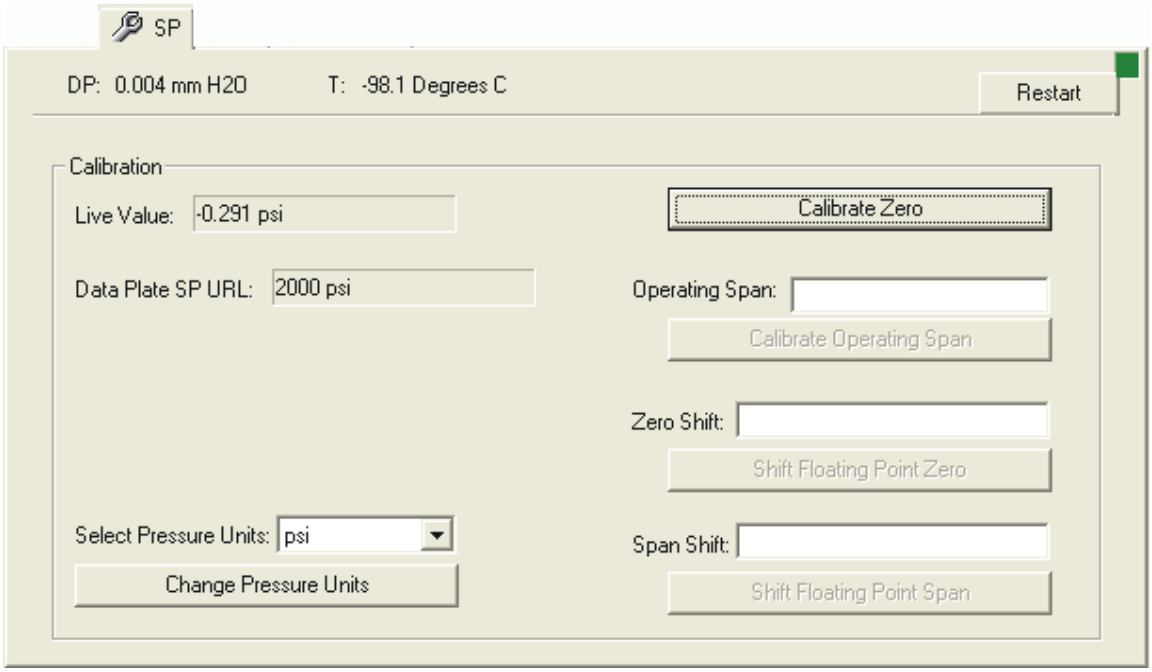


Figure 6-2. SP Tab – Calibrating Static Pressure

Calibrating Zero and Span

1. To calibrate the zero, vent the transmitter to atmosphere, so only atmospheric pressure is applied. Click **Calibrate Zero**, and the **Live Value** will be trimmed to be as close to the zero as possible.
2. To Calibrate the span, enter the desired span in the **Operating Span** field, then apply a pressure equivalent to the desired span. This value must be less than or equal to the **Data Plate SP URL** value. Then click **Calibrate Operating Span**. The **Live Value** will be trimmed to be as close to the desired span, as possible.

Shifting the SP Floating Point Number

If needed, the span and zero of the SP floating point number may be shifted a minor amount (±3% of URL) so that it correlates with the pressure standard used by the external process measuring device. A correction is achieved by calculating a shift correction factor and applying it to the floating point number by direct entry.

If it is determined that the difference at zero and upper end of the SP range is the same, then only a zero shift will be required.

> **Example**: Assume that the URL of the transmitter is 2000 psi and that it has been calibrated for a 0 to 500 psi range. If the 0 check point was read as 1.200, the difference would be: 0 - 1.200 = -1.200. A zero entry of -1.2 psi would provide the correlation between the floating point number and the standard of the

external device.

Note: Always set the zero point before attempting span calibration. Any zero errors will result in an equivalent span offset that complicates calibration.

To implement a zero correction, enter the correction value in the **Zero Shift** field, and click the **Shift Floating Point Zero** button. After a moment the reading in the **Live Value** field will reflect the change.

The attempted entry of values that exceed ±3% will result in an error message.

Should a correlation difference exist at the upper end of the range but none occurs at the zero end, only a span shift will be required.

> **Example**: Assume that the URL of the static pressure sensor is 2000 psi and that the calibrated range is 0 to 500 psi. If the **Live Value** field reads 0.000 and 500 psi and the external device reads 0.000 and 497.445 psi for these same points, the difference is 0 psi at the low end and 2.555 psi at the upper end. The span shift is calculated as follows: Span Shift = (± psi error) URL/Operating Point = (+2.555) 2000/500 = +10.22 psi

To implement a span correction, enter the correction value in the **Span Shift** field, and click the **Shift Floating Point Span** button. After a moment the reading in the **Live Value** field will reflect the change.

Values that exceed ±3% will elicit an error message and the previous values will be retained.

Changing the Pressure Units

Select the pressure units for the transmitter, from the **Select Pressure Units** list box, then click the **Change Pressure Units** button.

Note: To force a refresh after changing pressure units, click **Restart**.

6.3 Calibration of RTD Temperature

Note:: The maximum rated RTD cable length for the TeleTrans Transmitter (Model 3508) is 100 feet. This limitation is imposed to reduce noise pickup at electrically noisy sites and also to limit error due to line resistance. Users may employ longer cables provided they verify proper operation in their specific application.

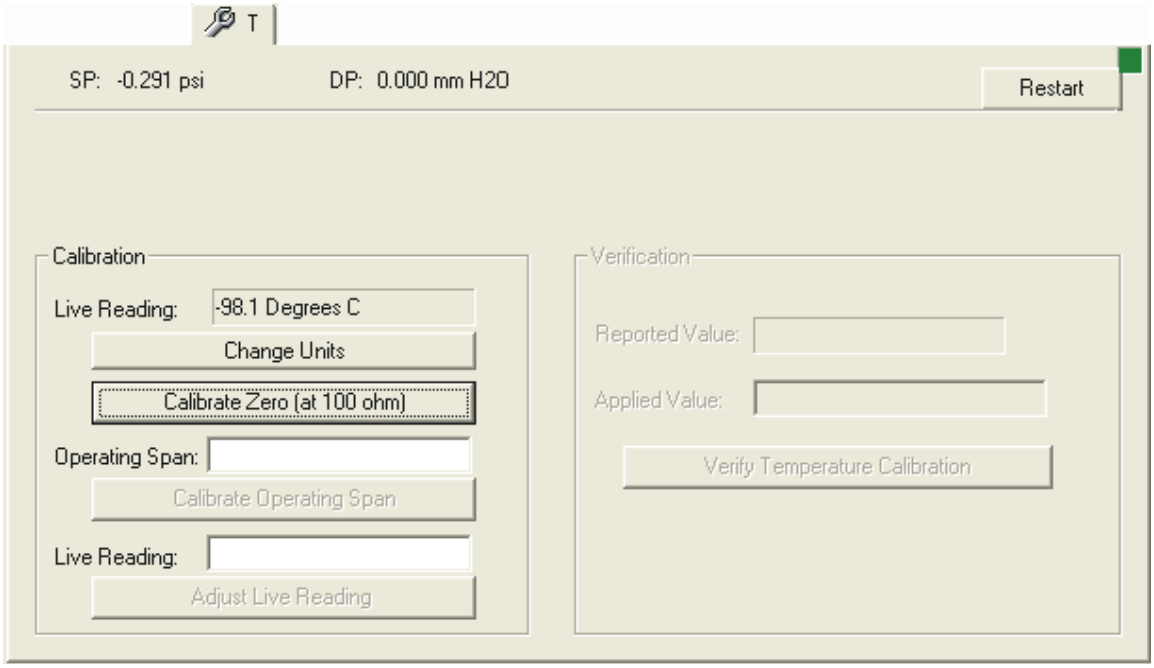


Figure 6-3. T tab – Calibrating RTD Temperature

The factory calibrates the internal temperature sensor to provide optimum transmitter accuracy and performance over a wide range of temperature conditions and cannot be changed in the field. However, the temperature output reading can be calibrated for the user's application.

Changing the Temperature Units

Readings can be displayed in either degrees Celsius or degrees Fahrenheit. To toggle the units from one to the other, click on the **Change Units** button. Output values will be scaled to the selected units.

Note: To force a refresh after changing units, click **Restart**.

Calibrating the Zero and Span

1. Disconnect the regular RTD and connect a 100 Ohm (±0.01%) precision resistor across the RTD terminals (this is equivalent to 32°F).
2. Observe the **Live Reading** and wait for it to stabilize.
3. Click on the **Calibrate Zero (at 100 OHMs)** button to calibrate the RTD zero.

4. Disconnect the resistor of step 1 and connect a 140.23 Ohm (±0.01%) precision resistor across the RTD terminals (this is equivalent to 220°F).
5. Observe the **Live Reading** and wait for it to stabilize.
6. Enter the desired operating span in the **Operating Span** field.
7. Click on the **Calibrate Operating Span** button.
8. Disconnect the resistor, and reconnect the RTD.

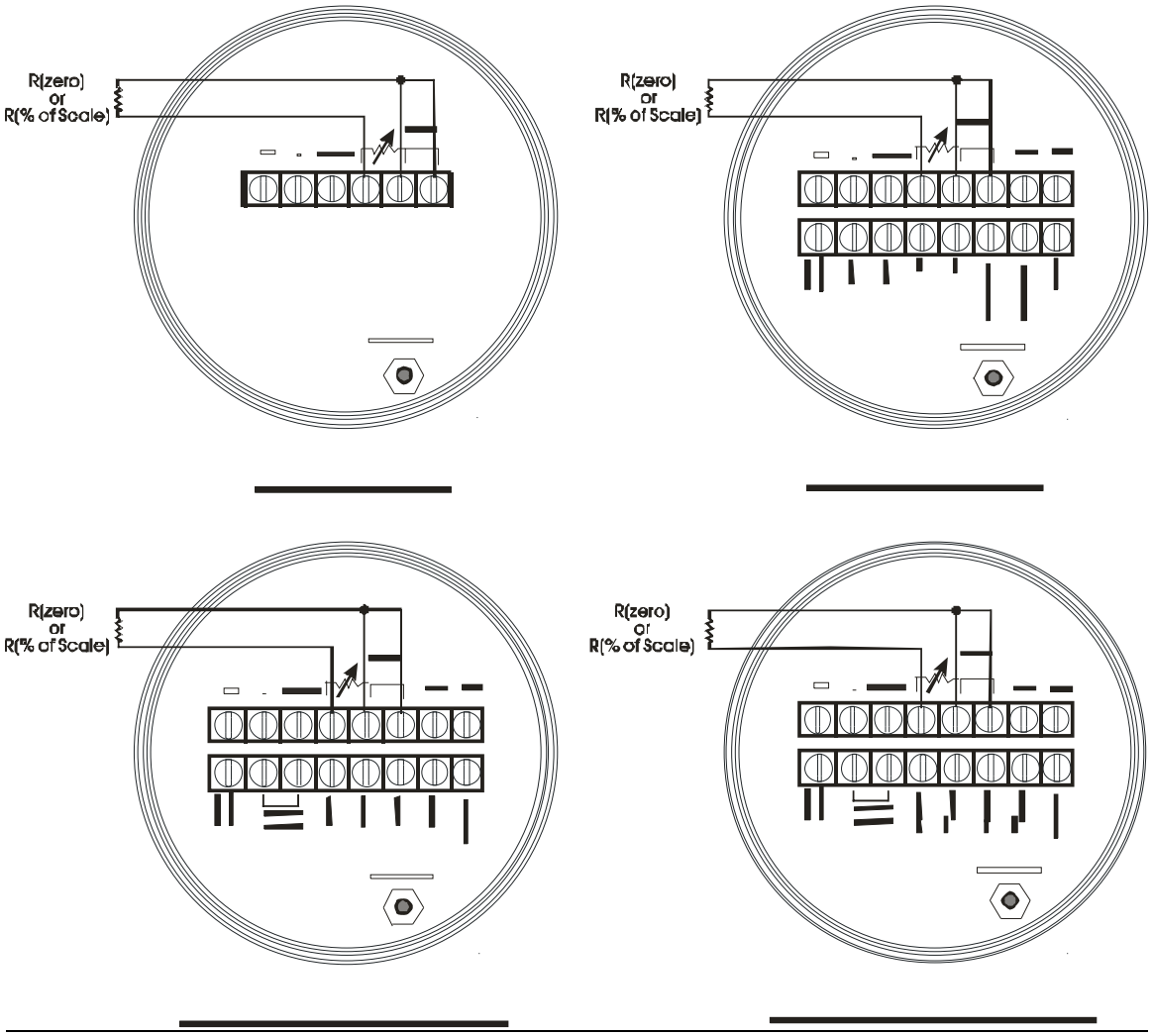


Figure 6-4. Model 3508 TeleTrans - Connections for RTD Calibration (See page 5-7 for resistor values)

Adjusting the Live Reading

If after re-connecting the unit to the process it is determined that the number in the **Live Reading** field does not correlate with that measured by an external process monitoring device, offset compensation may be performed. To do this, enter the desired reading in the **Live Reading** field, then click the **Adjust Live Reading** button.

Chapter 7 – Calibrating the 3808 Transmitter

This chapter covers calibration activities for the Bristol 3808-series transmitter.

For a general overview of calibration concepts, see *Chapter 5*.

For instructions on starting calibration mode, see *Section 5.4.4*.

In This Chapter

7.1 Calibration of Gage or Differential Pressure (3808-10A/3808-30A only) 7-1
7.2 Calibration of Static Pressure (3808-30A ONLY) 7-2
7.3 Calibration of RTD Temperature.....7-3
7.4 Calibrating the Analog Output (Analog Pressure Transducer models ONLY) 7-5

7.1 Calibration of Gage or Differential Pressure (3808-10A/3808-30A only)

The **Sensor LRL** and **Sensor URL** display the lower-range limit and upper range limit, respectively, of the gage pressure / differential pressure sensor.

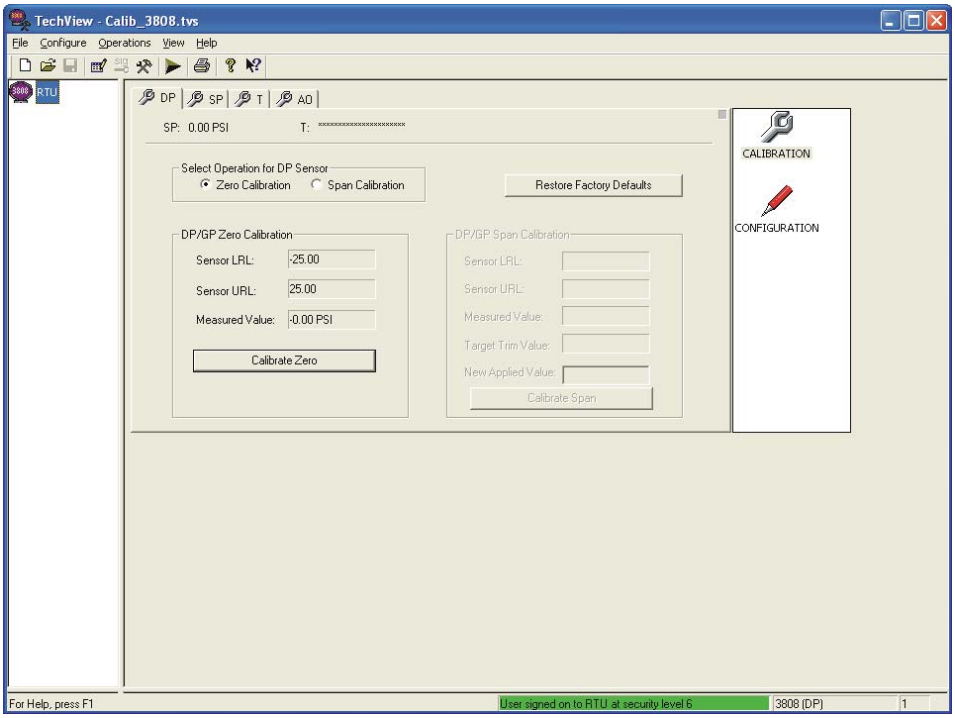


Figure 7-1. DP tab – Calibrating Gage or Differential Pressure

1. In the "Select Operation for DP Sensor" box, select **Zero Calibration**.

2. To perform the zero calibration, vent the transmitter to atmosphere, so no pressure is applied. Click on the **Calibrate Zero** button, and the **Measured Value** will be trimmed to be as close to the zero as possible.
3. To calibrate the span, select **Span Calibration** in the "Select Operation for DP Sensor" box, then apply a pressure equivalent to the desired span. Now enter the pressure you applied in the **New Applied Value** field. If the transmitter accepts the **New Applied Value**, the value you entered will be displayed in the **Target Trim Value** field. This value must be less than or equal to the **Sensor URL** value. Click on **Calibrate Span**. The **Measured Value** will be trimmed to be as close to the desired span, as possible. **Note:** Span calibration may only be performed successfully if the applied pressure and span are within ±3% of one another.

Note: If, for some reason, you want to return to the calibration that was performed by the factory, click on **Restore Factory Defaults**.

7.2 Calibration of Static Pressure (3808-30A ONLY)

Note: For static pressure calibration setup, connect identical supply pressures to both the low and high side ports of the MVT.

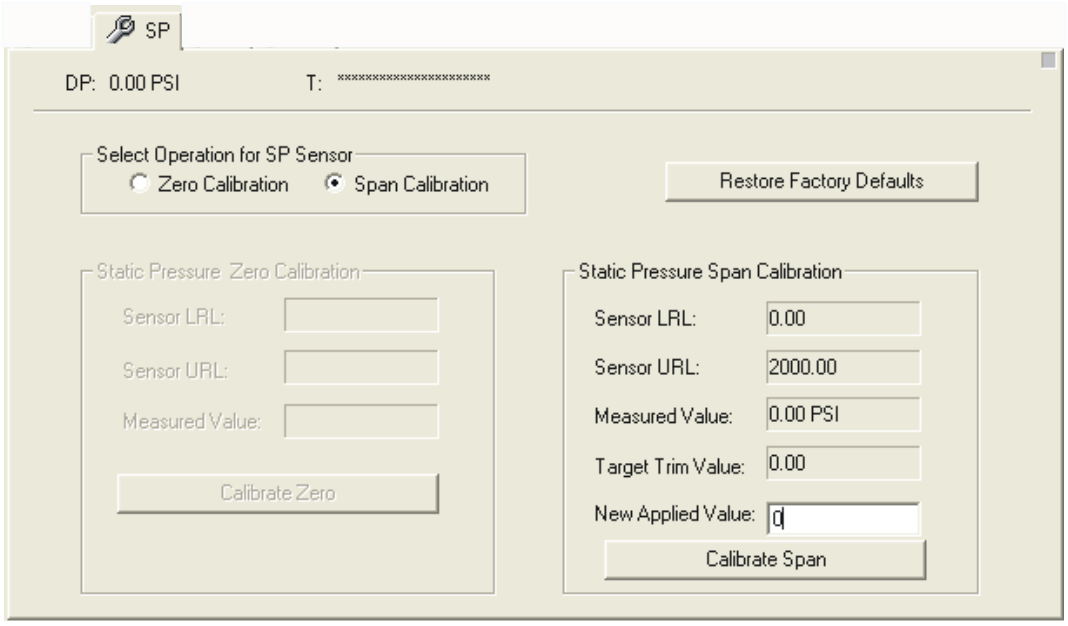


Figure 7-2. SP tab - Calibration of Station Pressure

The **Sensor LRL** and **Sensor URL** display the lower-range limit and upper range limit, respectively, of the static pressure sensor.

1. In the "Select Operation for SP Sensor" box, select **Zero Calibration**.

2. To perform the zero calibration, vent the transmitter to atmosphere, so only atmospheric pressure is applied. Click on the **Calibrate Zero** button, and the **Measured Value** will be trimmed to be as close to the zero as possible.

3. To calibrate the span, select **Span Calibration** in the "Select Operation for SP Sensor" box, then apply a pressure equivalent to the desired span. Now enter the pressure you applied in the **New Applied Value** field. If the transmitter accepts the **New Applied Value**, the value you entered will be displayed in the **Target Trim Value** field. This value must be less than or equal to the **"Sensor URL"** value. Click on **Calibrate Span**. The **Measured Value** will be trimmed to be as close to the desired span, as possible. **Note:** Span calibration may only be performed successfully if the applied pressure and span are within ±3% of one another.

Note: If, for some reason, you want to return to the calibration that was performed by the factory, click on **Restore Factory Defaults**.

7.3 Calibration of RTD Temperature

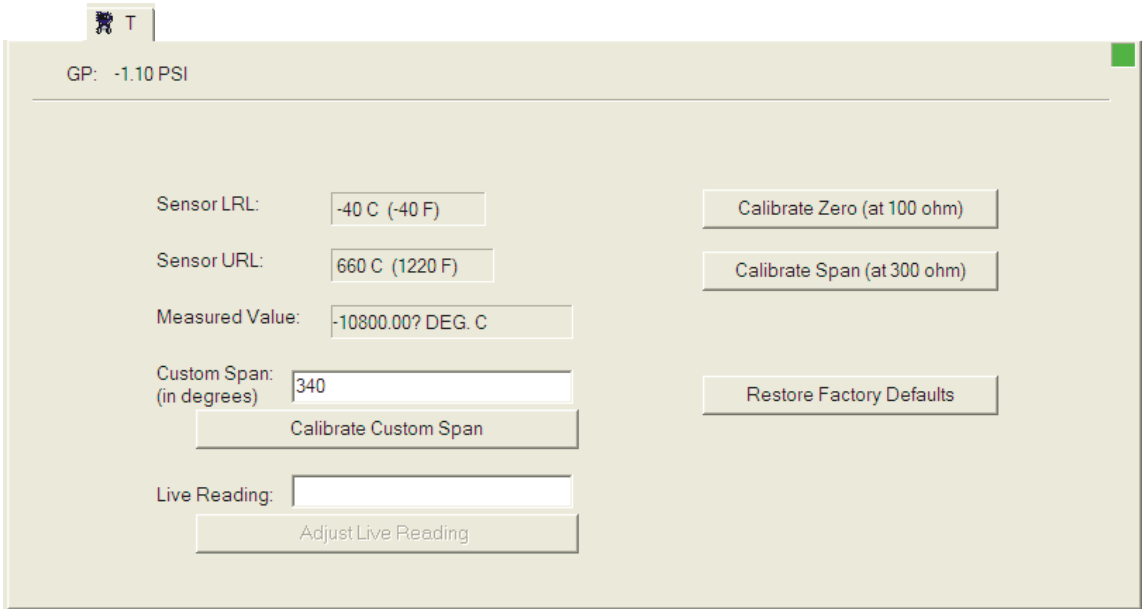


Figure 7-3. T tab – Calibration of RTD Temperature

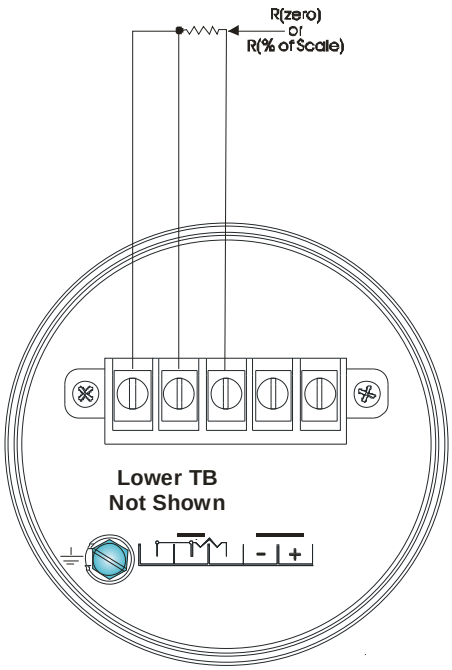


Figure 7-4. Model 3808 Transmitter RTD Calibration Connection Diagram (See Section 5.4.2 for resistor values)

1. Disconnect the regular RTD and connect a 100 Ohm (±0.01%) precision resistor across the RTD terminals (this is equivalent to 32°F).
2. Observe the **Measured Value** and wait for it to stabilize.
3. Click the **Calibrate Zero** button to calibrate the RTD zero.
4. Disconnect the resistor of step 1 and connect a precision resistor across the RTD terminals to represent your desired span.

   To calibrate to the default temperature span value of 558 °C (1036 °F) requires a resistance value of 300 ohms +/- 0.01%.

   To calibrate the temperature span to any other desired value, you must know the proper resistance value for that span. You must calculate this yourself or refer to a 100 ohm platinum RTD chart. For example, to calibrate the span to the upper range limit (URL) of the transmitter (660 °C, 1220 °F) requires a 332 ohm resistance +/- 0.01%. After you connect the required resistance, enter the desired temperature span value in the **Custom Span** field.
5. Observe the **Live Value** and wait for it to stabilize.
6. If you used a 300-ohm resistance in step 4, click the **Calibrate Span (at 300 ohm)** button; if you connected any other resistance value click the **Calibrate Custom Span** button.
7. Disconnect the resistor, and reconnect the RTD.

Notes:

- If, for some reason, you want to return to the calibration that was performed by the factory, click on **Restore Factory Defaults**.
- To change the reading from the RTD for the 3808, enter the desired reading (which should be similar to the actual reading, but presumably off slightly), and click on **Adjust Live Reading**.

7.4 Calibrating the Analog Output (Analog Pressure Transducer models ONLY)

3808 analog output calibration requires the following items:

- electrical supply source: +6Vdc (Min.), +42Vdc (Max.) – powers the transmitter
- digital multimeter (DMM) or ammeter with a 5-1/2 digit scale ±(0.005% accuracy)
- Transmitter Interface Unit (Part No. 389959-01-4)
- 250-ohm resistor (±0.01%, ¼ watt)

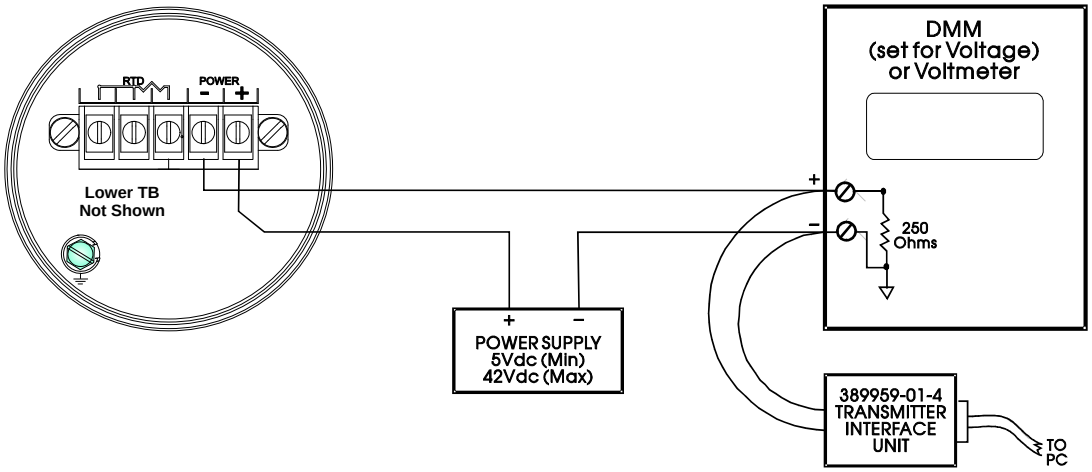


Figure 7-5. 3808 Analog Output Calibration - Voltage Measurement Diagram

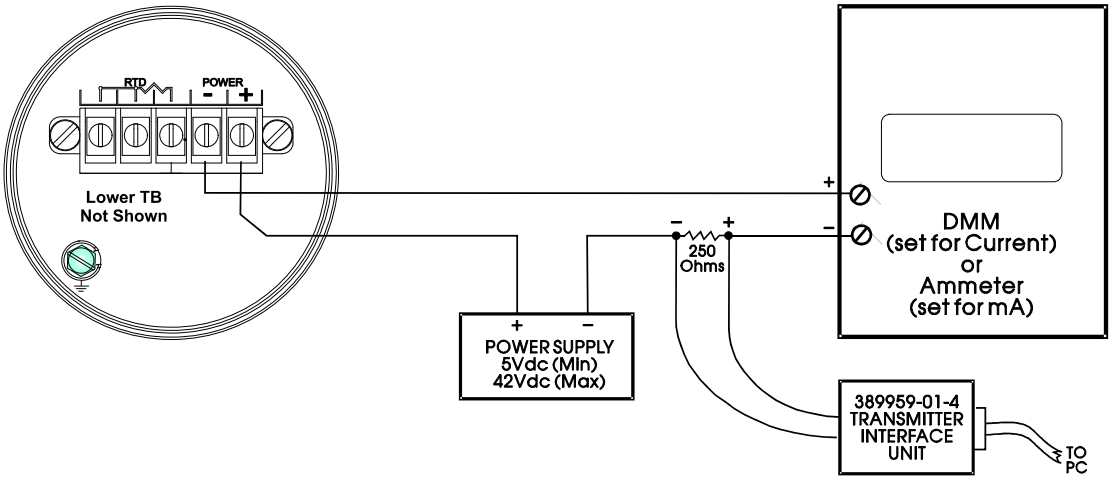


Figure 7-6. 3808 Analog Output Calibration - Current Measurement Diagram

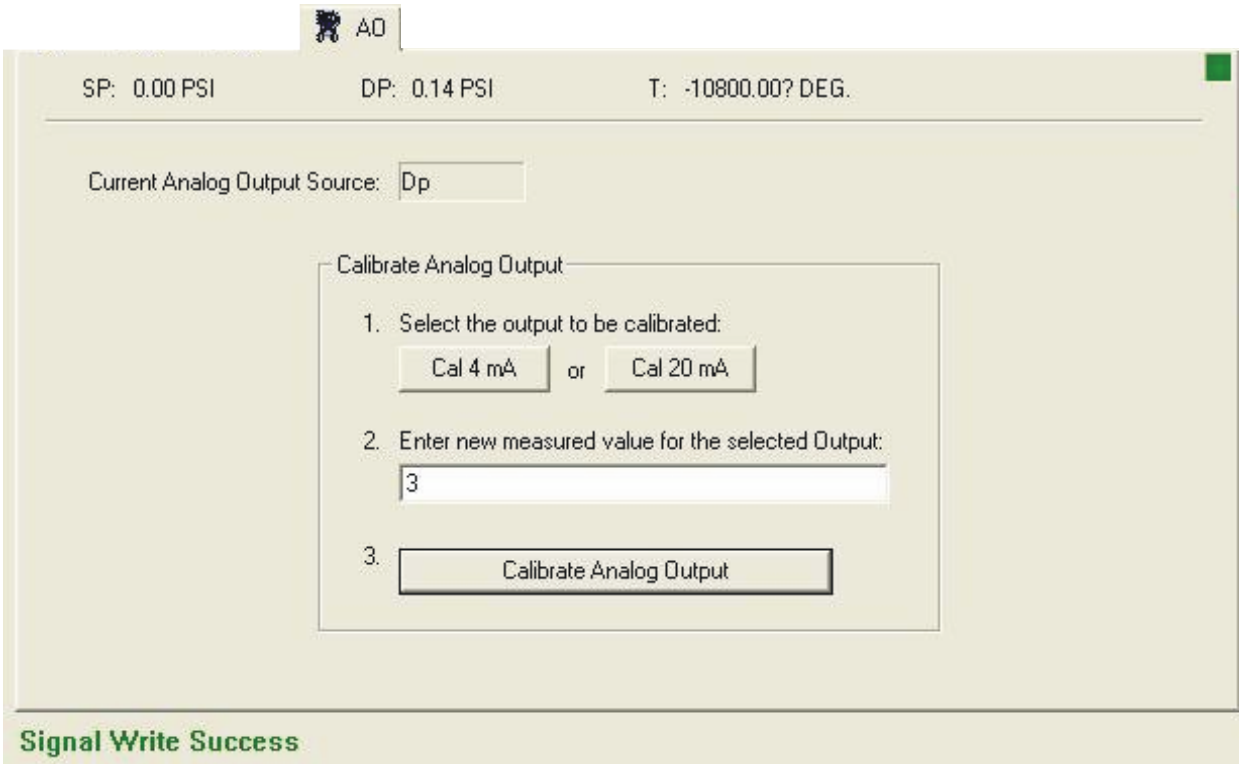


Figure 7-7. AO tab – Calibrating the Analog Output

Any of the three process variables (differential/gauge pressure, static pressure, or RTD temperature) can control the analog output of the transmitter. The analog output ranges from 4 mA to 20 mA, but the 4 mA and 20 mA points may change over time and require calibration. The measured variable in this case is the value read by an accurate milli-ammeter or voltmeter connected to the analog output.

To calibrate the analog output:

1. For **Select the output to be calibrated** choose "Cal 4 mA". Measure the current or voltage externally, and enter the measured value in the **Enter new measured value for the selected Output** field, in milliamperes.
2. To calibrate, select the **Calibrate Analog Output** button. The 3808 will adjust and save the new settings.
3. Repeat steps 1 and 2, but this time select "Cal 20 mA" for the **Select the output to be calibrated** choice.

Note: When calibrating the 4mA point, only measured value entries between 3mA and 5mA are accepted. When calibrating the 20mA point, only measured value entries between 19mA and 21mA are accepted.

Chapter 8 – Calibrating the 3530 TeleFlow-series Flow Computers

This chapter covers calibration activities for the Bristol 3530-series flow computers (TeleFlow, TeleRecorder, TeleCorrector).

For a general overview of calibration concepts, see *Chapter 5*.

For instructions on starting calibration mode, see *Section 5.4.4*.

In This Chapter

8.1 Calibration of Differential/Gage Pressure 8-1
8.2 Verification of Differential Pressure 8-2
8.3 Calibration of Static Pressure 8-2
8.4 Verification of Static Pressure....8-3
8.5 Calibration of RTD Temperature....8-4
8.5.1 Verification of RTD Temperature....8-6
8.6 Damping....8-6
8.6.1 Configuring the Damping Time....8-7
8.7 Calibrating TeleRecorder Inputs (3530-45B/55B ONLY) 8-7
8.7.1 Calibrating the Input 8-8

Important **Whenever performing calibration operations on a 3530-series unit, you must be connected to the *local* port of the 3530. You cannot perform calibration via the network port of the 3530**

8.1 Calibration of Differential/Gage Pressure

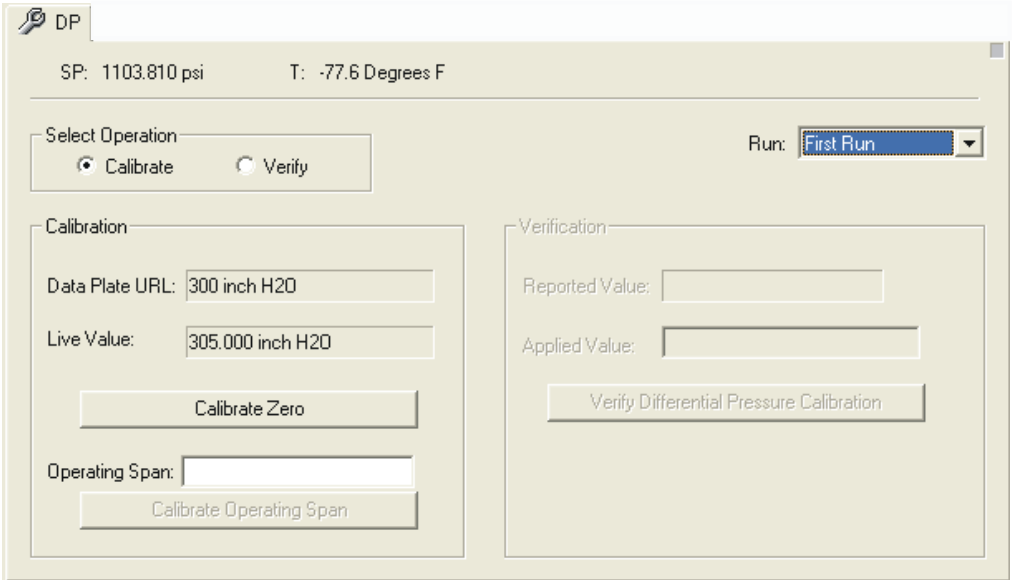


Figure 8-1. DP tab – Calibration of Differential / Gage Pressure

1. If this flow computer is handling more than one meter run, first select the run you want to configure from the **Run** list box.
2. In the "Select Operation" box, select **Calibrate**.
3. To calibrate the zero, vent the transmitter to atmosphere, so atmospheric pressure is applied. Click on the **Calibrate Zero** button, and the **Live Value** will be trimmed to be as close to the zero as possible.
4. To calibrate the span, enter the desired span in the **Operating Span** field, then apply a pressure equivalent to the desired span. This value must be less than or equal to the **Data Plate URL** value. Then click on **Calibrate Operating Span**. The **Live Value** will be trimmed to be as close to the desired span, as possible.

8.2 Verification of Differential Pressure

Note: This must be performed using an external test fixture that can apply various pressures.

1. If this flow computer is handling more than one meter run, first select the run you want to configure from the **Run** list box.
2. In the "Select Operation" box, select **Verify**.
3. Using an external test fixture, apply a known pressure. When the **Reported Value** is steady, enter the pressure you applied in the **Applied Value** field, then click on **Verify Differential Pressure Calibration**. Repeat this process using the external test fixture to apply known pressures of 0, 50, 100, 80, 20, and 0 percent of span.

Note: If, during the verification procedure, the transmitter is found to be out of calibration, perform the calibration procedure to correct the discrepancy.

8.3 Calibration of Static Pressure

For static pressure, the same pressure must be applied to both the HI and LO inputs of the transmitter, thus producing a zero differential across the HI and LO ports, and a SP value at the HI port.

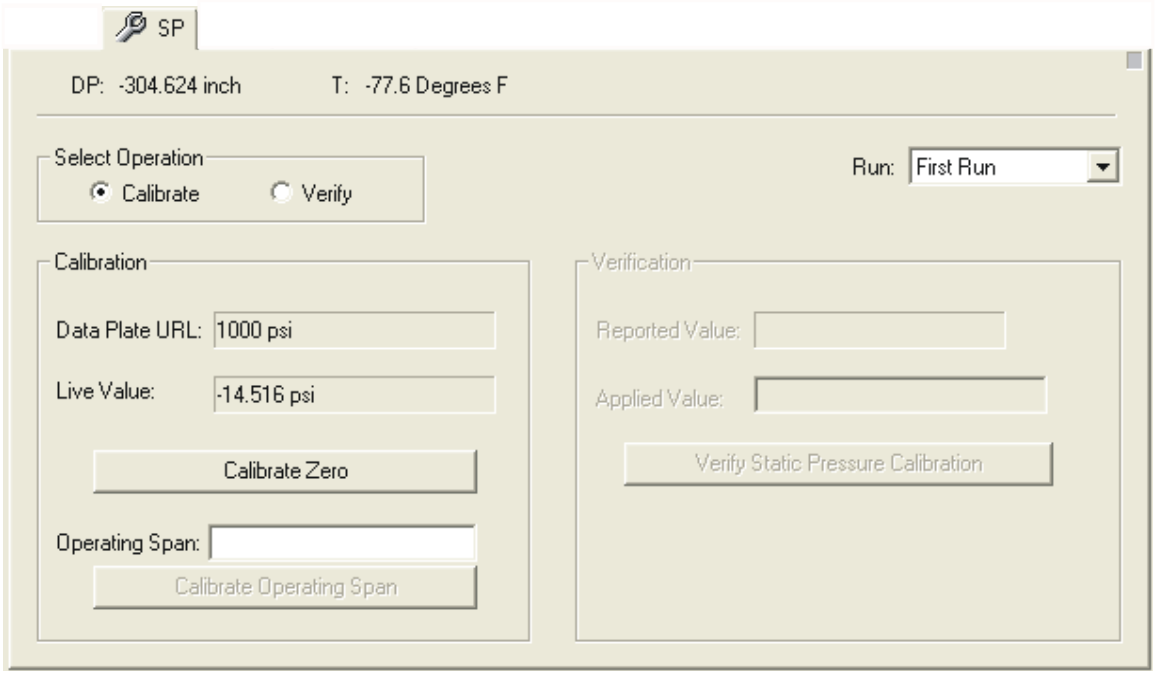


Figure 8-2. SP tab – Calibration of Static Pressure

1. If this flow computer is handling more than one meter run, first select the run you want to configure from the **Run** list box.
2. In the "Select Operation" box, select **Calibrate**.
3. To calibrate the zero, vent the transmitter to atmosphere, so no pressure is applied. Click on the **Calibrate Zero** button, and the **Live Value** will be trimmed to be as close to the zero as possible.
4. To calibrate the span, enter the desired span in the **Operating Span** field, then apply a pressure equivalent to the desired span. This value must be less than or equal to the **Data Plate URL** value. Then click on **Calibrate Operating Span**. The **Live Value** will be trimmed to be as close to the desired span, as possible.

8.4 Verification of Static Pressure

Note: This must be performed using an external test fixture that can apply various pressures.

1. If this flow computer is handling more than one meter run, first select the run you want to configure from the **Run** list box.
2. In the "Select Operation" box, select **Verify**.
3. Using an external test fixture, apply a known pressure. When the **Reported Value** is steady, enter the pressure you applied in the **Applied Value** field, then click on **Verify Static Pressure Calibration**. Repeat this process using the external test fixture to apply known pressures of 0, 50, 100, 80, 20, and 0 percent of span.

Note: If, during the verification procedure, the transmitter is found to be out of calibration, perform the calibration procedure to correct the discrepancy.

8.5 Calibration of RTD Temperature

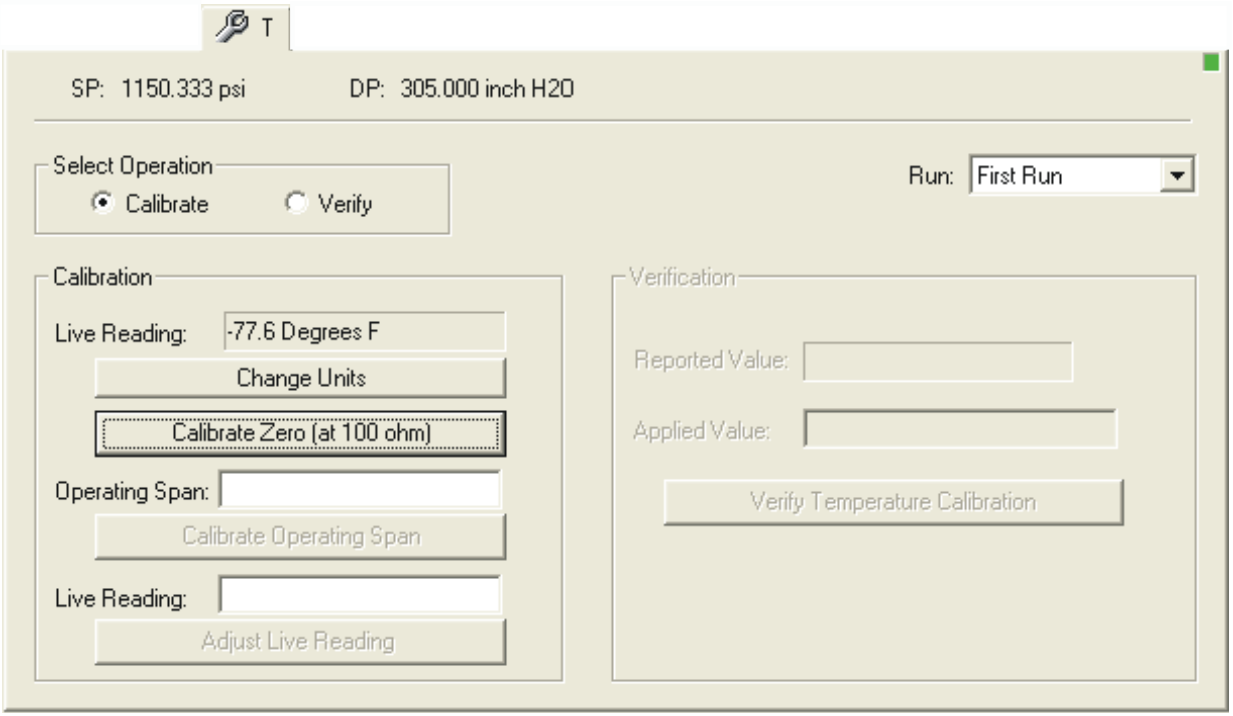


Figure 8-3. T tab – Calibration of RTD Temperature

1. If this flow computer is handling more than one meter run, first select the run you want to configure from the **Run** list box.
2. In the Select Operation box, select **Calibrate**.
3. You have the option of displaying the temperature in either Fahrenheit or Celsius; to switch the units displayed, click on the **Change Units** button.
4. Disconnect the regular RTD and connect a 100 Ohm (±0.01%) precision resistor across the RTD terminals (this is equivalent to 32°F).
5. Observe the **Live Reading** and wait for it to stabilize.
6. Click on the **Calibrate Zero (at 100 OHMs)** button to calibrate the RTD zero.

7. Disconnect the resistor of step 4 and connect a 140.23 Ohm (±0.01%) precision resistor across the RTD terminals (this is equivalent to 220°F).
8. Observe the **Live Reading** and wait for it to stabilize.
9. Enter the desired operating span in the **Operating Span** field.
10. Click on the **Calibrate Operating Span** button.
11. Disconnect the resistor, and reconnect the RTD.
12. If after re-connecting the unit to the process it is determined that the number in the **Live Reading** field does not correlate with that measured by an external process-monitoring device, offset compensation may be performed. To do this, enter the desired reading, and click on the **Adjust Live Reading** button.

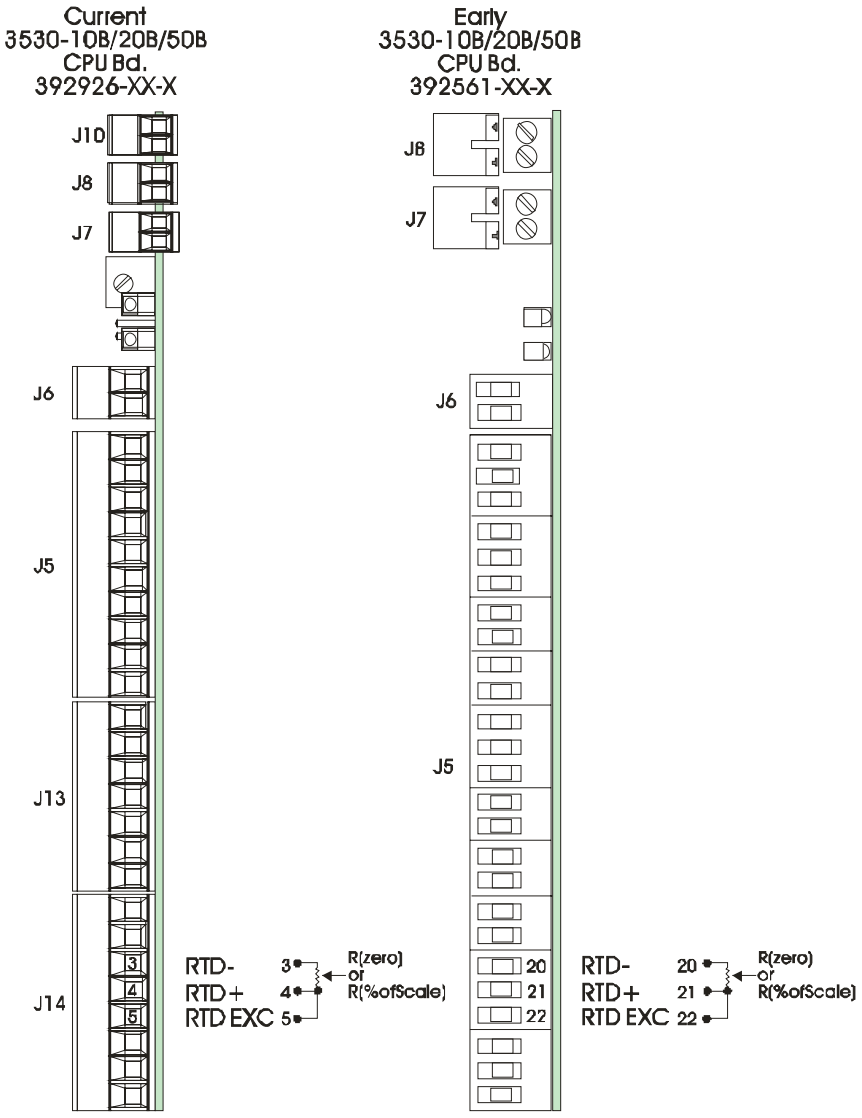


Figure 8-4. TeleFlow CPU Board RTD Calibration Connection Diagram (See page 5-7 for resistor values)

8.5.1 Verification of RTD Temperature

1. If this flow computer is handling more than one meter run, first select the run you want to configure from the **Run** list box.
2. In the "Select Operation" box, select **Verify**.
3. Disconnect the regular RTD and connect a 100 Ohm (±0.01%) precision resistor across the RTD terminals (this is equivalent to 32°F).
4. The regular RTD must be disconnected, and replaced with a resistor which simulates the desired temperature.
5. When the **Reported Value** is steady, enter the value you applied in the **Applied Value** field, then click on the **Verify Temperature Calibration** button.
6. Repeat this process with other test values (typically 0, 50, 100, 80, 20, 0 percent of scale values would be applied.)

8.6 Damping

The output damping feature controls the rate at which the output responds to a given change of input. It is used to slow down the output response to a rapid or oscillatory change of the measured variable.

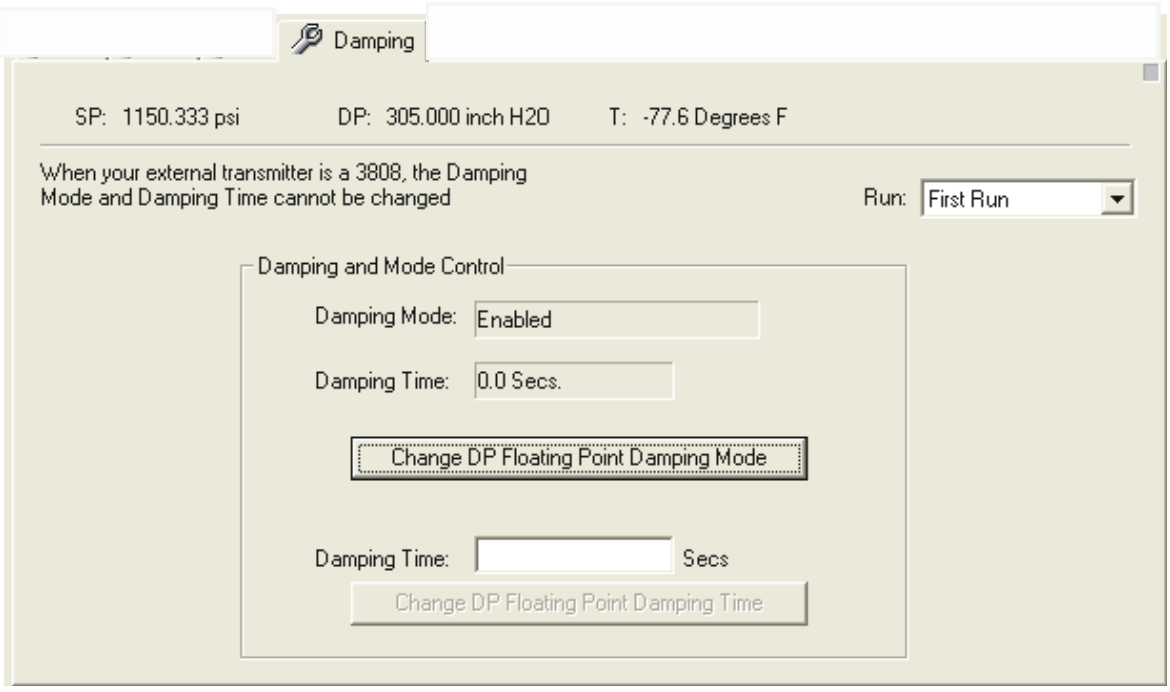


Figure 8-5. Damping tab

The **Damping Time** is a period of time during which the indicated value changes only 63% of the difference between the "present measured variable" and the "present indicated pressure" in one damping time period. It would take 5 times the DP floating point damping time

for the "present indicated pressure" to equal the "present measured pressure" (if a change in the "present measured pressure" didn't occur).

An increase in the DP floating point damping time results in an increased smoothing of the indicated value.

Note: In the case of a model 3530-series unit, if the external transmitter is a model 3808, damping mode is always enabled and can't be changed; damping time can't be changed either.

8.6.1 Configuring the Damping Time

1. If this flow computer is handling more than one meter run, first select the run you want to configure from the **Run** list box.
2. Enable the damping feature (if it isn't already active) by clicking on the **Change DP Floating Point Damping Mode** button. (The currently active mode is displayed in the **Damping Mode** field).
3. To change the **Damping Time** enter a new damping time (in seconds) in the **Damping Time** field, then click on the **Change DP Floating Point Damping Time** button.

Note: If you later decide to disable the damping feature, click *again* on **Change DP Floating Point Damping Mode**.

8.7 Calibrating TeleRecorder Inputs (3530-45B/55B ONLY)

Important **The "Inputs" page provides for gage pressure calibration of inputs to remove the effect of sensor zero offset and slope variation. You must calibrate the zero first.**

Gage pressure calibration requires the following items:

- Instrument mounting fixture: This fixture must secure the instrument such that the presure transducer is mounted vertically.
- a pressure gauge (must cover the range of the pressure transducer)
- an adequate pressure regulator
- a pressure source and interconnect lines

A test fixture that incorporates the items listed above may be used. A typical 3530-series pressure transducer calibration interconnection diagram is provided, below:

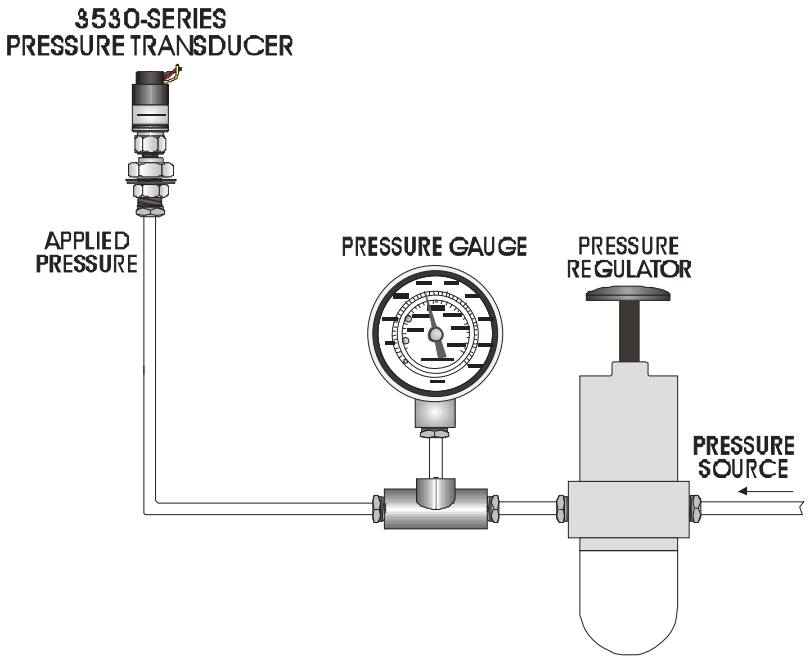


Figure 8-6. 3530-45B/-55B TeleRecorder Pressure Transducer Connections

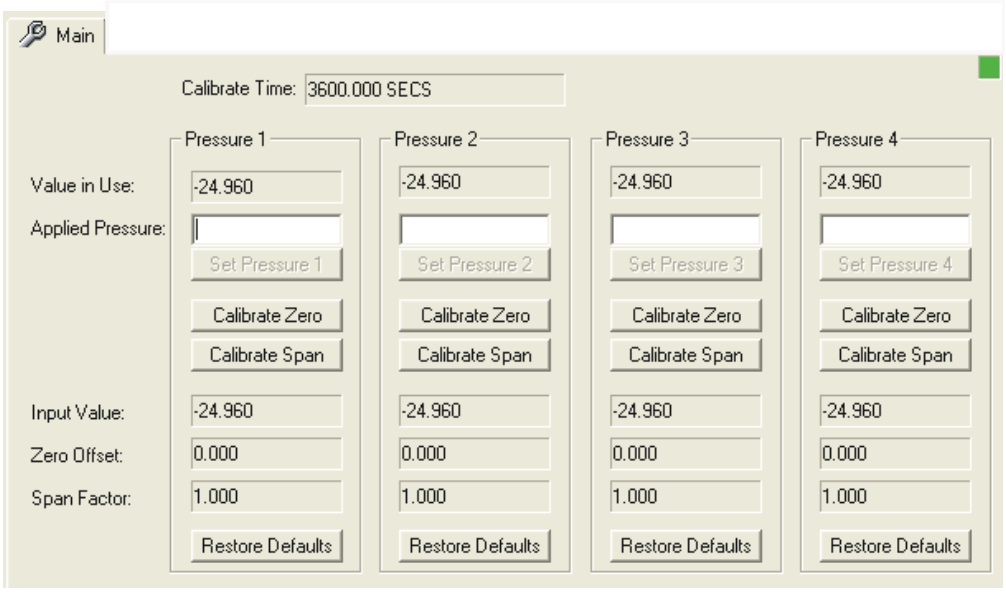


Figure 8-7. Main tab

8.7.1 Calibrating the Input

Note: Calibration mode only remains active for the length of time indicated in the **Calibrate Time** field. Otherwise, **Zero Offset** and **Span Factor** will be set to 0.000 and 1.000, respectively.

1. First, calibrate the ZERO. You should apply atmospheric pressure when calibrating the ZERO. Click on **Calibrate Zero**. The load calculates a **Zero Offset** that will be added to the sensor reading to

remove any existing offset at zero pressure. For example, a 1000 psig sensor may be reading 1002 psig with no pressure applied. After calibration a -2.0 zero offset will be used on the **Input Value** to remove the +2 psig offset.

2. To calibrate the span, apply 25% to 100% of sensor URL pressure, and enter the applied value in the **Applied Pressure** field, then click the **Calibrate Span** button to do a span factor calculation. The load calculates a **Span Factor** that will be applied to the **Input Value** reading to compensate for slope variation. For example, with zero offset already calculated and 50 psig applied a 100 psig sensor may be reading 49 psig because the sensor slope is slightly off. The load will calculate and apply a span correction factor of 50/49 = 1.0205 to the **Input Value** to compensate for the slope variation. THIS CALIBRATION DOES NOT LINEARIZE THE SENSOR INPUT READING - IT ONLY COMPENSATES FOR ZERO OFFSET AND SLOPE VARIATION. The result of applying zero offset and span factor to the **Input Value** is the **Value in Use**. The ACCOL load executes every 15 seconds; so allow time for results to appear.

Note: If desired, you can clear the **Zero Offset** and **Span Factor** values by clicking on **Restore Defaults**; the offset and span factors are set to 0.0 and 1.0 respectively.

Chapter 9 – Calibrating the ControlWave EFM / GFC-CL /GFC/ XFC

This chapter covers calibration activities for the ControlWave EFM, GFC, XFC, and GFC-CL.

For a general overview of calibration concepts, see *Chapter 5*.

For instructions on starting calibration mode, see *Section 5.4.4*.

In This Chapter

9.1 Calibration of Differential/Gage Pressure 9-1
9.2 Verification of Differential/Gage Pressure 9-2
9.3 Calibration of Static Pressure 9-4
9.4 Verification of Static Pressure....9-5
9.5 Calibration of RTD Temperature....9-6
9.6 Verification of Temperature 9-9
9.7 Damping....9-11
9.7.1 Configuring the Damping Time....9-11
9.8 Orifice....9-12
9.8.1 Specifying the Orifice Plate Size 9-12

9.1 Calibration of Differential/Gage Pressure

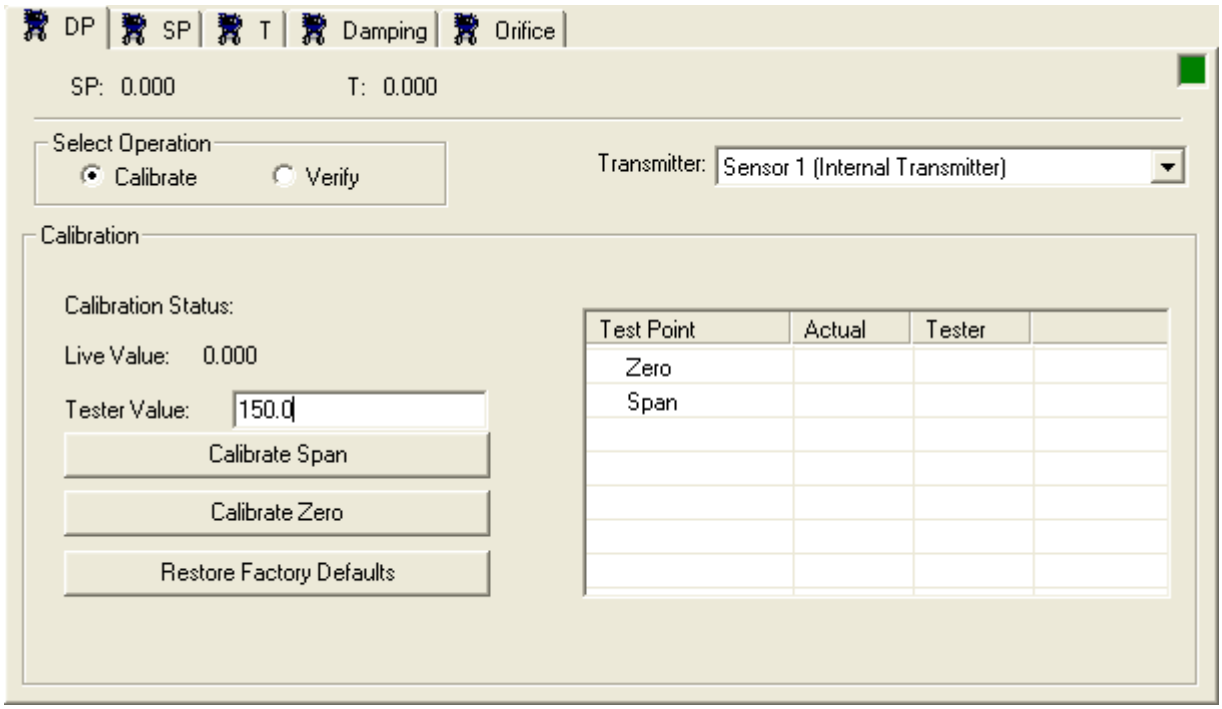


Figure 9-1. DP tab – Calibration of Differential / Gage Pressure

1. Select the transmitter you want to calibrate using the **Transmitter** list box. "Wet ends" refer to internal transmitters; all other transmitters are external.
2. In the "Select Operation" box, select **Calibrate.**
3. To perform the zero calibration, vent the transmitter to atmosphere, so no pressure is applied.
4. Wait for the **Live Value** to become steady, and enter a **Tester Value** equivalent to the zero value.
5. Click on **Calibrate Zero** and the **Live Value** will be trimmed to be as close to the zero as possible. If you are calibrating the internal transmitter, the **Calibration Status** will be set to SUCCESS or FAIL based on whether the trim operation was successful. Calibration status is not available for external transmitters. The page displays the **Live Value** and **Tester Value** in the **Actual** and **Tester** value fields, respectively, for the Zero test point.
6. To calibrate the span, apply a pressure equivalent to the desired span, and wait for the **Live Value** to settle.
7. Now enter the pressure you applied in the **Tester Value** field and click on **Calibrate Span**. The **Live Value** will be trimmed to be as close to the desired span, as possible. If you are calibrating the internal transmitter, the **Calibration Status** will be set to SUCCESS or FAIL based on whether the trim operation was successful. Calibration status is not available for external transmitters. The page displays the **Live Value** and **Tester Value** in the **Actual** and **Tester** value fields, respectively, for the span test point.

Note: If, for some reason, you want to return to the calibration that was performed by the factory, click on **Restore Factory Defaults**.

9.2 Verification of Differential/Gage Pressure

You perform verification as a check to see whether calibration is required, or after calibration is completed to verify proper calibration. You choose **As Found** to record that verification readings are before calibration, or **As Left** to record that verification readings are after calibration.

For a DP, you must perform verification at a minimum of two points, typically at zero (the high and low side of the transmitter equalized) and with a differential pressure applied across the high and low sides of the transmitter (typically, the upper range limit). Typically you would use three, five, or seven verification points to verify differential pressure.

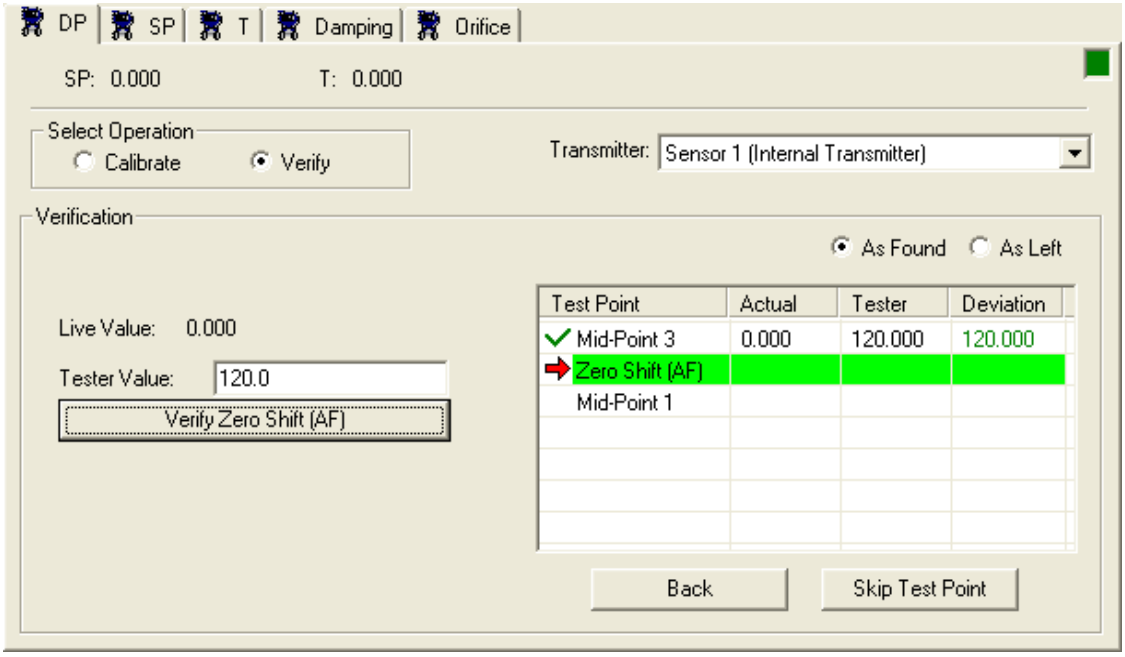


Figure 9-2. DP tab – Verification of Differential / Gage Pressure

1. Select the transmitter you want to verify using the **Transmitter** list box. "Wet ends" refer to internal transmitters; all other transmitters are external.
2. In the "Select Operation" box, select **Verify.**
3. If you are performing the verification prior to calibration, choose **As Found.** If you are performing the verification after calibration, choose **As Left**. This choice determines where readings are stored for the calibration report.
4. Depending upon your application, you may have multiple test points to check in sequence. For the first test point, apply a known pressure using a deadweight tester, or similar device and let the reading stabilize. Enter the **Tester Value** which represents the known pressure value you applied, then click on the button labeled with that test point. The grid in the right side of the screen displays the **Actual Value** read from the transmitter, the **Tester Value** you entered, and then calculates the difference between these values and displays it in the **Deviation** field. The cursor advances to the next test point.
5. Repeat step 4 for each additional test point. If you make a mistake and want to re-run the verification for a particular test point, click the **Back** button. If you want to skip over a test point, click the **Skip Test Point** button.

9.3 Calibration of Static Pressure

Note: For static pressure calibration setup, connect identical supply pressures to both the low and high side ports of the MVT.

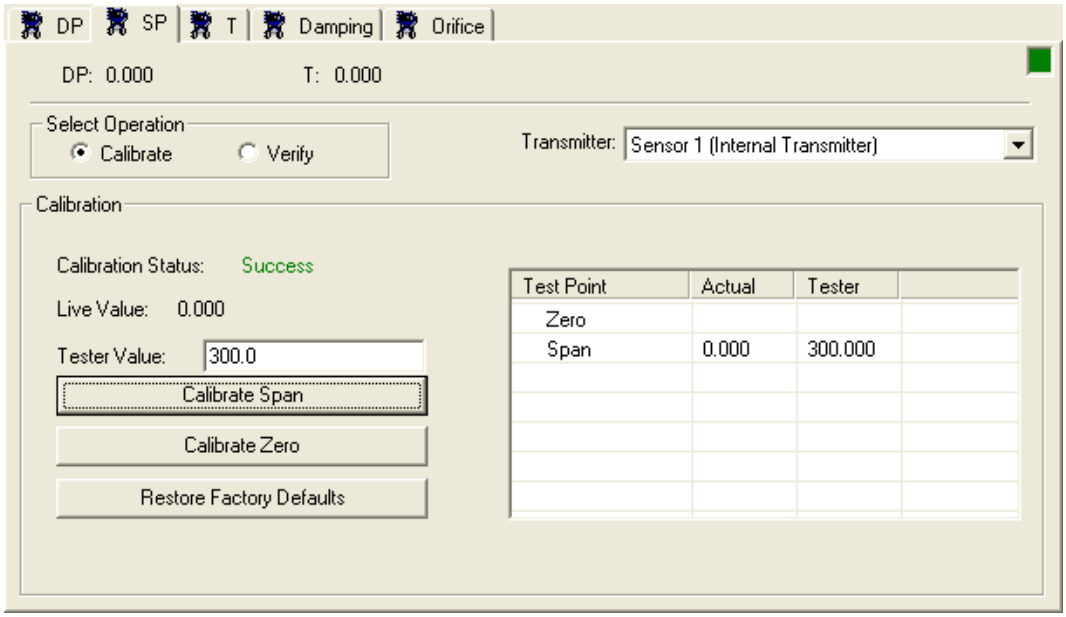


Figure 9-3. SP tab – Calibration of Static Pressure

1. Select the transmitter you want to calibrate using the **Transmitter** list box. "Wet ends" refer to internal transmitters; all other transmitters are external.
2. To perform the zero calibration, vent the transmitter to atmosphere, so atmospheric pressure is applied. Wait for the **Live Value** to become steady, and enter a **Tester Value** equivalent to the zero value.
3. Click on **Calibrate Zero** and the **Live Value** will be trimmed to be as close to the zero as possible. If you are calibrating the internal transmitter, the **Calibration Status** will be set to SUCCESS or FAIL based on whether the trim operation was successful. Calibration status is not available for external transmitters. The page displays the **Live Value** and **Tester Value** in the **Actual** and **Tester** value fields, respectively, for the Zero test point.
4. To calibrate the span, apply a pressure equivalent to the desired span, and wait for the **Live Value** to settle. Now enter the pressure you applied in the **Tester Value** field and click on **Calibrate Span**. The **Live Value** will be trimmed to be as close to the desired span, as possible. If you are calibrating the internal transmitter, the **Calibration Status** will be set to SUCCESS or FAIL based on whether the trim operation was successful. Calibration status is not available for external transmitters. The page displays the **Live Value** and **Tester Value** in the **Actual** and **Tester** value fields, respectively, for the Span test point.

Note: If, for some reason, you want to return to the calibration that was performed by the factory, click on **Restore Factory Defaults**.

9.4 Verification of Static Pressure

You perform verification as a check to see whether calibration is required, or after calibration is completed to verify proper calibration. You choose **As Found** to record that verification readings are before calibration, or **As Left** to record that verification readings are after calibration.

For static pressure transmitters, you must perform verification at a minimum of two points, typically at zero (the transmitter vented to atmosphere) and under pressure (often, the upper range limit, or if that is not practical, near the typical operating range of the transmitter).

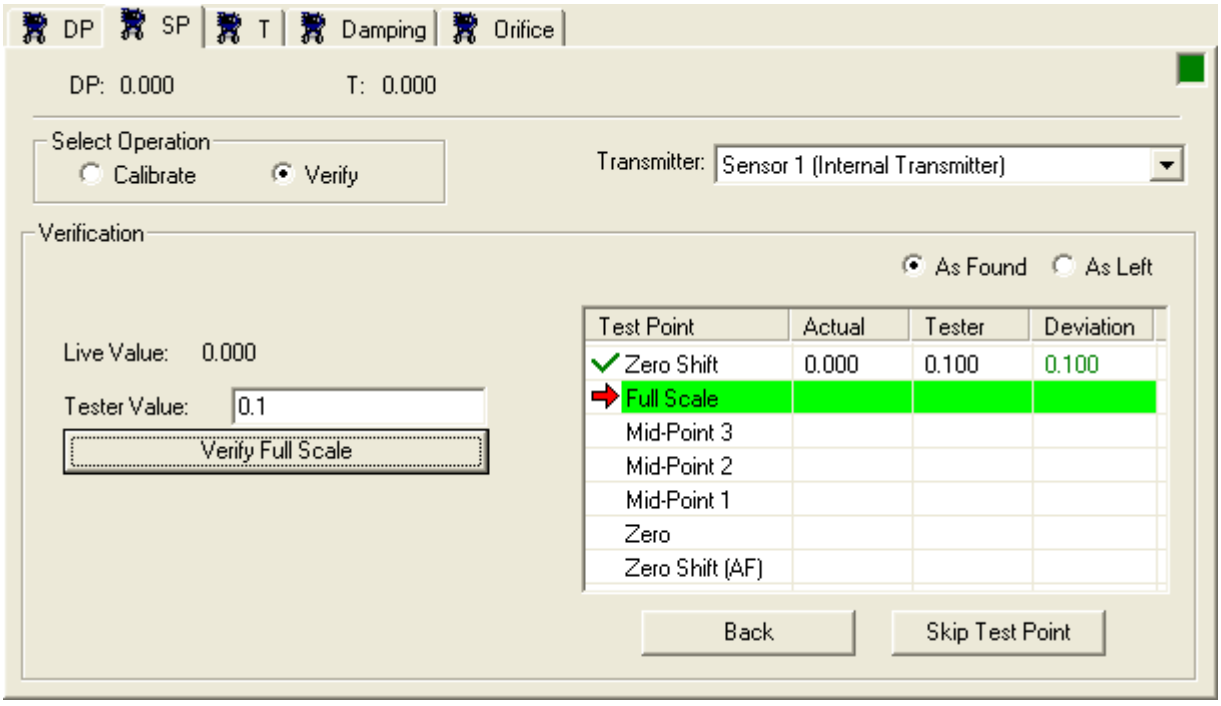


Figure 9-4. SP tab – Verification of Static Pressure

1. Select the transmitter you want to verify using the **Transmitter** list box. "Wet ends" refer to internal transmitters; all other transmitters are external.
2. In the "Select Operation" box, select **Verify.**
3. If you are performing the verification prior to calibration, choose **As Found.** If you are performing the verification after calibration, choose **As Left**. This choice determines where reading are stored for the calibration report.

4. Depending upon your application, you may have multiple test points to check in sequence. For the first test point, apply a known pressure using a deadweight tester, or similar device and let the reading stabilize. Enter the **Tester Value** which represents the known pressure value you applied, then click on the button labeled with that test point. The grid in the right side of the screen displays the **Actual Value** read from the transmitter, the **Tester Value** you entered, and then calculates the difference between these values and displays it in the **Deviation** field. The cursor advances to the next test point.
5. Repeat step 4 for each additional test point. If you make a mistake and want to re-run the verification for a particular test point, click the **Back** button. If you want to skip over a test point, click the **Skip Test Point** button.

9.5 Calibration of RTD Temperature

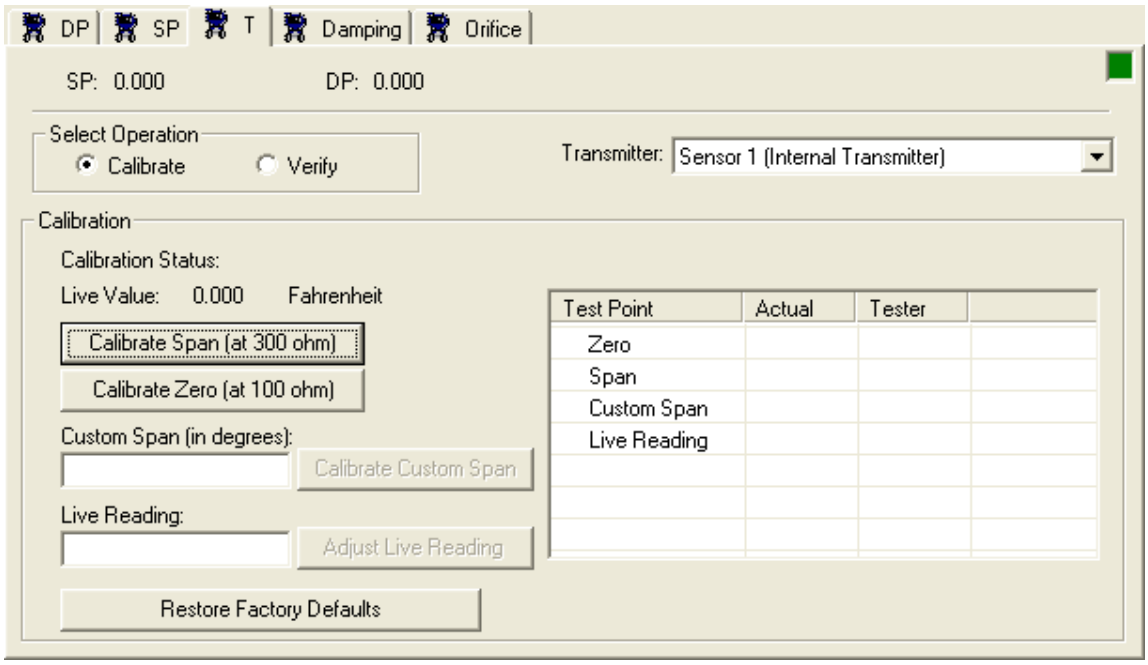


Figure 9-5. T tab - Calibration of RTD Temperature

1. Select the transmitter you want to calibrate using the **Transmitter** list box. "Wet ends" refer to internal transmitters; all other transmitters are external.
2. Disconnect the regular RTD and connect a 100 Ohm (±0.01%) precision resistor across the RTD terminals (which is equivalent to 32°F)
3. Observe the **Live Value** and wait for it to stabilize.
4. Click on the **Calibrate Zero (at 100 ohm)** button to calibrate the RTD zero. If you are calibrating the internal transmitter, the

Calibration Status will be set to SUCCESS or FAIL based on whether the trim operation was successful. Calibration status is not available for external transmitters.

5. Disconnect the resistor of step 2 and connect a precision resistor across the RTD terminals to represent your desired span.

   To calibrate to the default temperature span value of 558 °C (1036 °F) requires a resistance value of 300 ohms +/- 0.01%.

   To calibrate the temperature span to any other desired value, you must know the proper resistance value for that span. You must calculate this yourself or refer to a 100 ohm platinum RTD chart. For example, to calibrate the span to the upper range limit (URL) of the transmitter (660 °C, 1220 °F) requires a 332 ohm resistance +/- 0.01%. After you connect the required resistance, enter the desired temperature span value in the **Custom Span** field.

6. Observe the **Live Value** and wait for it to stabilize.

7. If you used a 300-ohm resistance in step 5, click the **Calibrate Span (at 300 ohm)** button; if you connected any other resistance value click the **Calibrate Custom Span** button. In either case, if you are calibrating the internal transmitter, the **Calibration Status** will be set to SUCCESS or FAIL based on whether the trim operation was successful. Calibration status is not available for external transmitters. Disconnect the resistor, and reconnect the RTD.

8. To change the reading from the RTD, enter the desired reading in the **Live Reading** field (which should be similar to the actual reading, but presumably off slightly), and click on **Adjust Live Reading**. The page displays the actual reading, and the live reading you entered in the **Actual** and **Tester** fields, respectively.

Note: If, for some reason, you want to return to the calibration that was performed by the factory, click on **Restore Factory Defaults**.

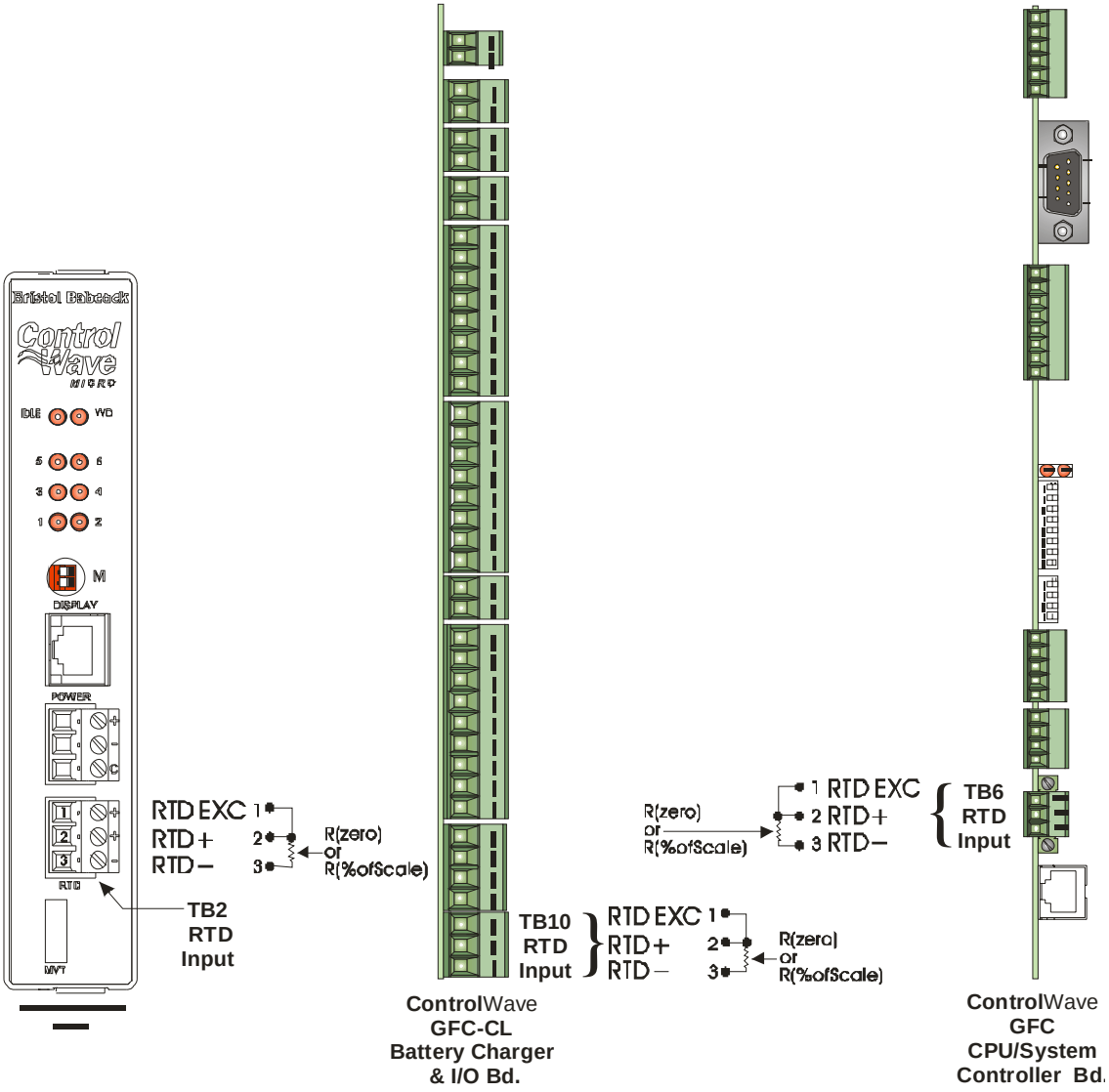


Figure 9-6. Connections for RTD Temperature Calibration – ControlWave EFM, ControlWave GFC-CL, ControlWave GFC (See page 5-7 for resistor values)

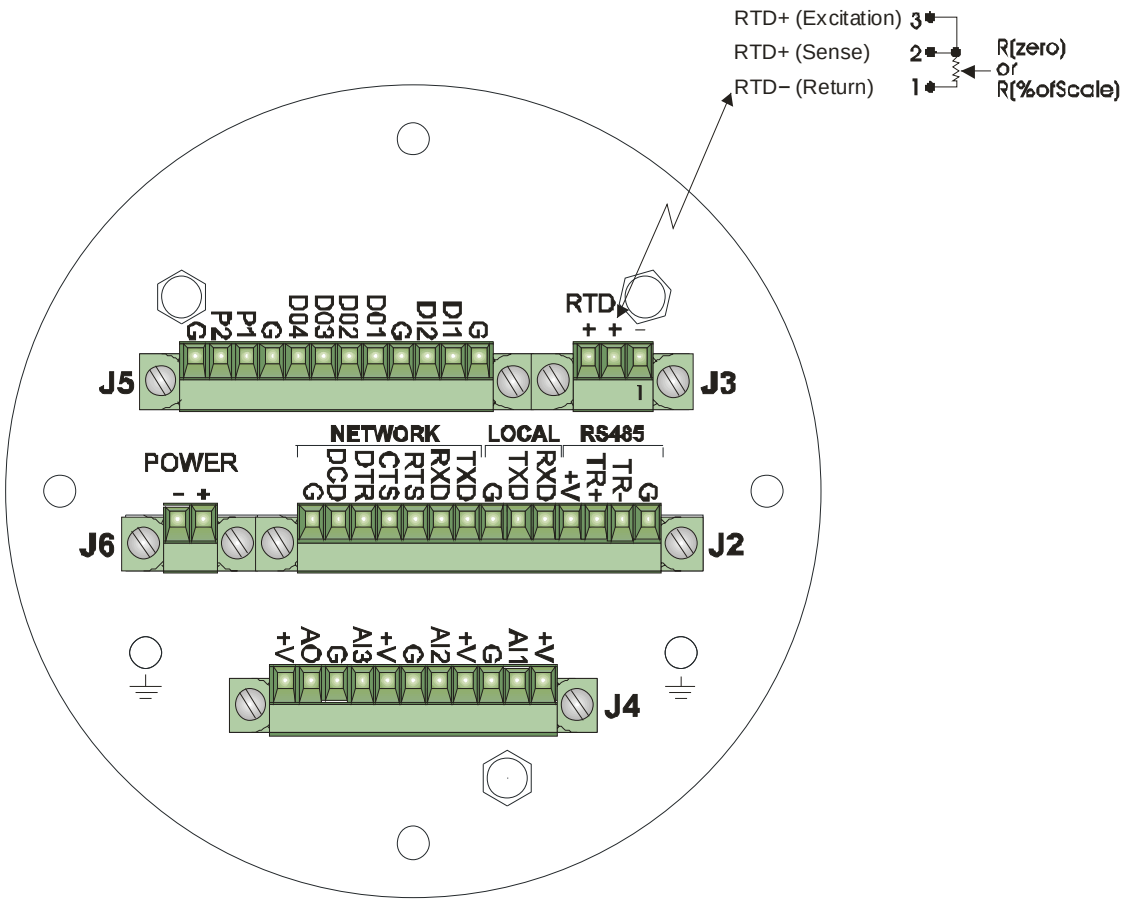


Figure 9-7. Connections for RTD Temperature Calibration – ControlWave XFC (see page 5-7 for resistor values)

9.6 Verification of Temperature

You perform verification as a check to see whether calibration is required, or after calibration is completed to verify proper calibration. You choose **As Found** to record that verification readings are before calibration, or **As Left** to record that verification readings are after calibration.

For temperature transmitters, you can perform verification at two points, but more often, you would use single point verification. You perform the single point verification by measuring the process temperature with a calibrated thermometer, and comparing the results to the temperature indicated by the temperature transmitter.

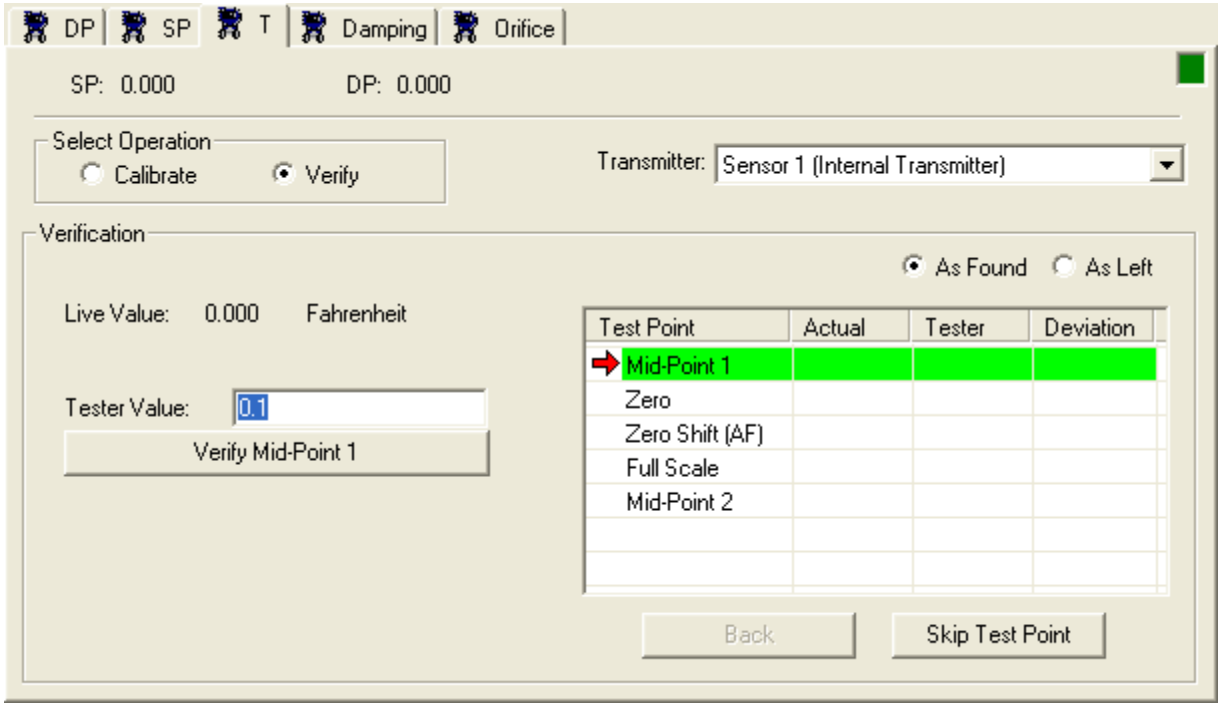


Figure 9-8. T tab – Verification of Temperature

1. Select the transmitter you want to verify using the **Transmitter** list box. "Wet ends" refer to internal transmitters; all other transmitters are external.
2. In the "Select Operation" box, select **Verify.**
3. If you are performing the verification prior to calibration, choose **As Found.** If you are performing the verification after calibration, choose **As Left**. This choice determines where reading are stored for the calibration report.
4. Depending upon your application, you may have multiple test points to check in sequence. For the first test point, apply a known pressure using a deadweight tester, or similar device and let the reading stabilize. Enter the **Tester Value** which represents the known pressure value you applied, then click on the button labeled with that test point. The grid in the right side of the screen displays the **Actual Value** read from the transmitter, the **Tester Value** you entered, and then calculates the difference between these values and displays it in the **Deviation** field. The cursor advances to the next test point.
5. Repeat step 4 for each additional test point. If you make a mistake and want to re-run the verification for a particular test point, click the **Back** button. If you want to skip over a test point, click the **Skip Test Point** button.

9.7 Damping

The output damping feature controls the rate at which the output responds to a given change of input. It is used to slow down the output response to a rapid or oscillatory change of the measured variable.

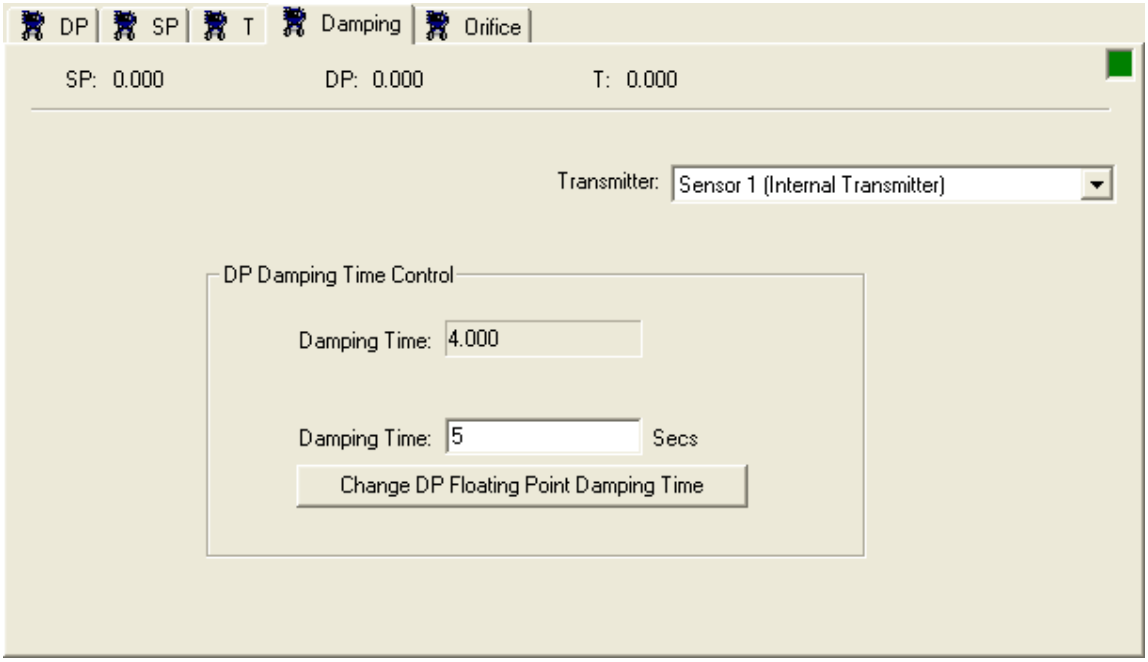


Figure 9-9. Damping tab

The **Damping Time** is a period of time during which the indicated value changes only 63% of the difference between the "present measured variable" and the "present indicated pressure" in one damping time period. It would take 5 times the DP Floating Point Damping Time for the "present indicated pressure" to equal the "present measured pressure" (if a change in the "present measured pressure" didn't occur).

An increase in the DP Floating Point Damping Time results in an increased smoothing of the indicated value.

Note: If the External Transmitter is a model 3808, damping mode is always enabled and can't be changed; damping time can't be changed either.

9.7.1 Configuring the Damping Time

1. Select the transmitter you want to change the damping time for using the **Transmitter** list box. "Wet ends" refer to internal transmitters; all other transmitters are external.
2. To change the **Damping Time** enter a new damping time (in seconds) in the **Damping Time** field, then click on the **Change DP Floating Point Damping Time** button. This writes the new damping time to your application in the ControlWave.

9.8 Orifice

If you change the orifice plate on your pipe, you can use the Orifice tab to update your application with the new orifice plate diameter..

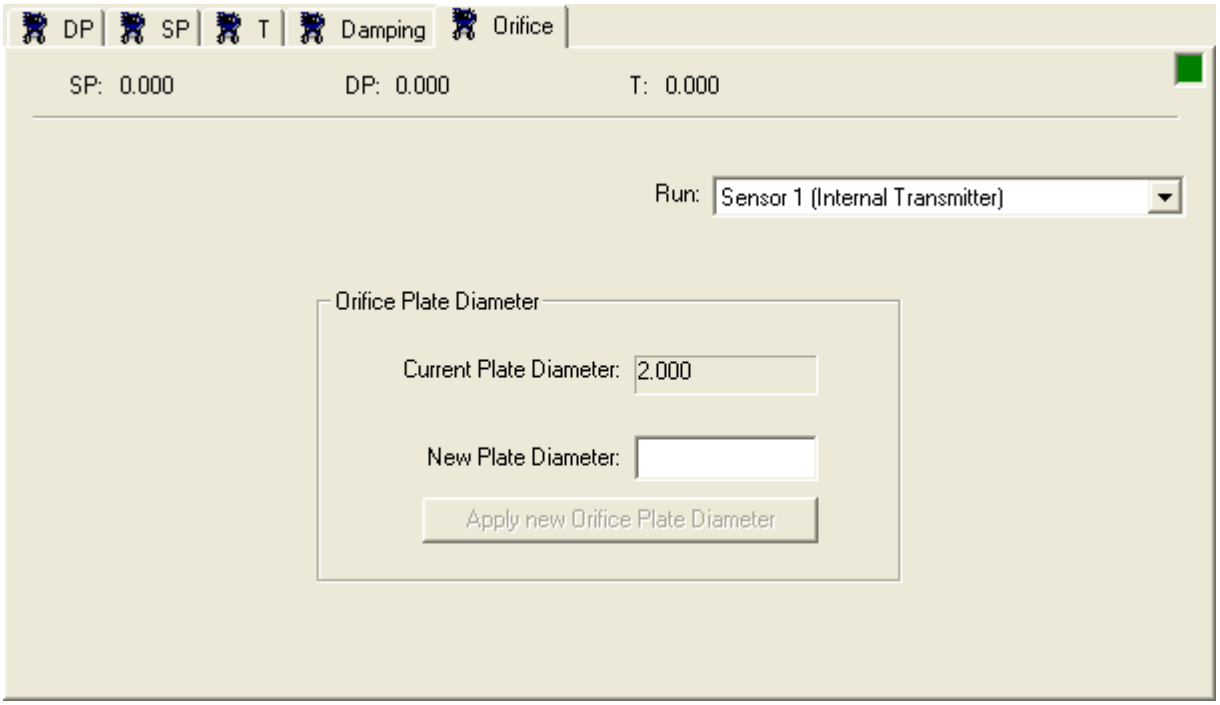


Figure 9-10. Orifice tab

9.8.1 Specifying the Orifice Plate Size

1. Select the transmitter using the **Transmitter** list box. "Wet ends" refer to internal transmitters.
2. Enter the **New Plate Diameter** and click the **Apply new Orifice Plate Diameter** button. This writes the new orifice diameter to your application in the ControlWave. The **Current Plate Diameter** field updates with the new value.

Chapter 10 – Configuring and Calibrating the 4088B

This chapter covers configuration and calibration activities for the Rosemount 4088B transmitter.

For a general overview of calibration concepts, see *Chapter 5*.

For instructions on starting calibration mode, see *Section 5.4.4*.

In This Chapter

10.1 Configuring the 4088B 10-1
10.1.1 DP/GP Pressure 10-2
10.1.2 Static Pressure 10-2
10.1.3 Temperature 10-3
10.1.4 Serial Port Setup 10-4
10.1.5 Transmitter Data 10-5
10.1.6 RTD Coefficients 10-6
10.2 Calibrating the 4088B 10-6
10.2.1 Calibration of Gage or Differential Pressure 10-7
10.2.2 Calibration of Static Pressure 10-7
10.2.3 Calibration of RTD Temperature 10-9

10.1 Configuring the 4088B

Click the Configuration icon

to bring up the Config tab.

The Config tab includes buttons for calling up menus to configure the sensor.

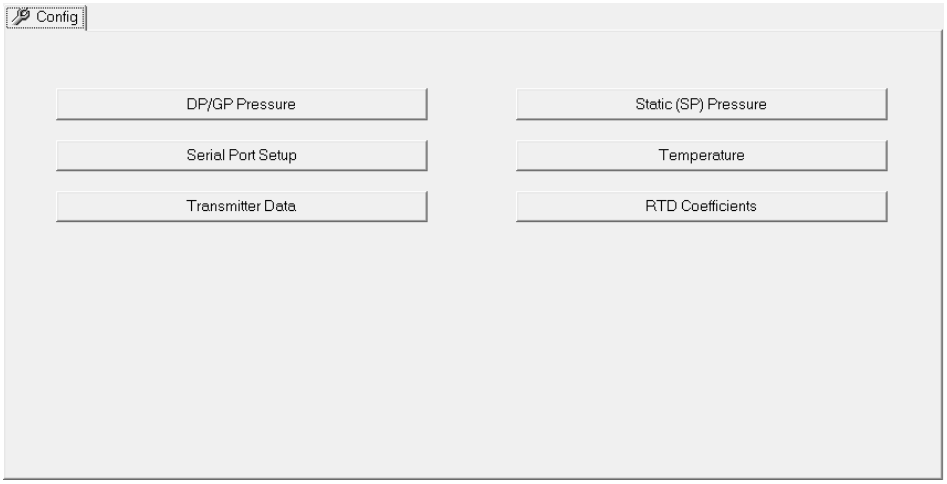


Figure 10-1. Config tab

Note: The menus may be re-sized so they may appear different from the illustrations shown here.

10.1.1 DP/GP Pressure

Configuration options for the differential pressure variable consist of setting the damping, selecting the engineering units, and setting lower and upper range values.

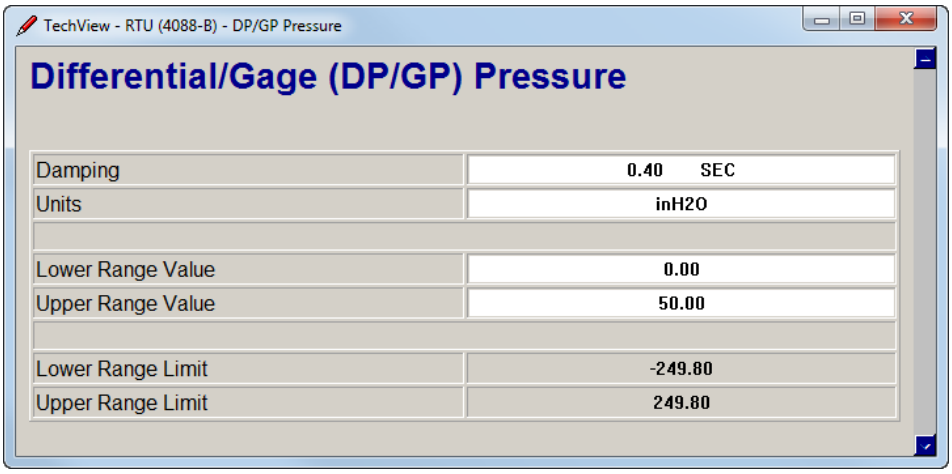


Figure 10-2. Configuring the Differential/Gage (DP/GP) Pressure Variable

1. Click **DP/GP Pressure** to open the DP/GP Pressure menu.
2. Specify a **Damping** value from 0.0 (none) to 30.0 seconds. For a step change in input it takes five times the damping value for the reading to reach the new input. For example, an input change from 60 inH2O to 70 inH2O will take five seconds when damping is set to 1. Similarly, an input change from 60 inH2O to 70 inH2O will take 20 seconds when damping is set to 4.
3. Select the engineering **Units** for the differential pressure variable.
4. Specify the **Lower Range Value** (LRV). The LRV should be the lowest value for the DP/GP variable you want to measure for your process. This cannot be less than the **Lower Range Limit** (LRL) which represents the factory set lowest value for the range of values the sensor can read.
5. Specify the **Upper Range Value** (URV). The URV should be the highest value for the DP/GP variable you want to measure for your process. This cannot be more than the **Upper Range Limit** (URL) which represents the factory set highest value for the range of values the sensor can read.

10.1.2 Static Pressure

Configuration options for the static pressure variable consist of setting the damping, selecting the engineering units, and setting lower and upper range values.

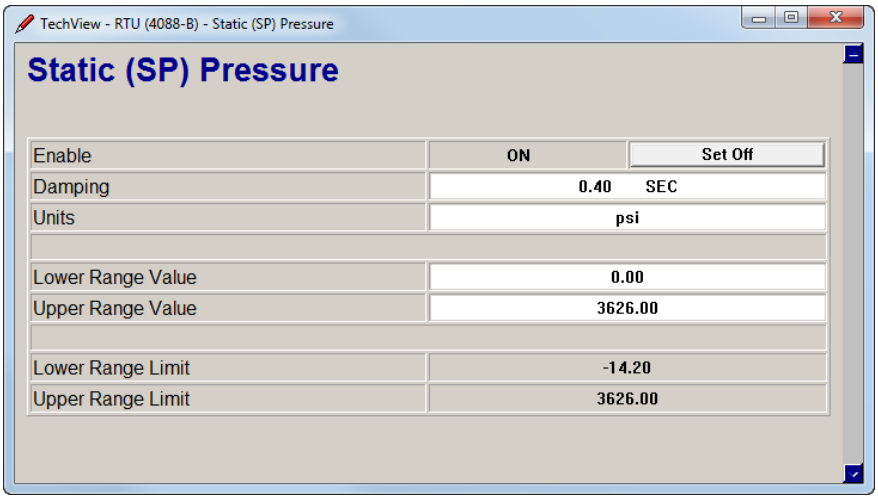


Figure 10-3. Configuring the Static (SP) Pressure Variable

1. Click **Static (SP) Pressure** to open the Static (SP) Pressure menu.
2. Click **Set On** to enable SP conversion; click **Set Off** to disable SP conversion.
3. Specify a **Damping** value from 0.0 (none) to 30.0 seconds. For a step change in input it takes five times the damping value for the reading to reach the new input. For example, an input change from 60 psi to 70 psi will take five seconds when damping is set to 1. Similarly, an input change from 60 psi to 70 psi will take 20 seconds when damping is set to 4.
4. Select the engineering **Units** for the static pressure variable.
5. Specify the **Lower Range Value** (LRV). The LRV should be the lowest value for the SP variable you want to measure for your process. This cannot be less than the **Lower Range Limit** (LRL) which represents the factory set lowest value for the range of values the sensor can read.
6. Specify the **Upper Range Value** (URV). The URV should be the highest value for the SP variable you want to measure for your process. This cannot be more than the **Upper Range Limit** (URL) which represents the factory set highest value for the range of values the sensor can read.

10.1.3 Temperature

Configuration options for the temperature variable consist of setting the damping, selecting the engineering units, and setting lower and upper range values.

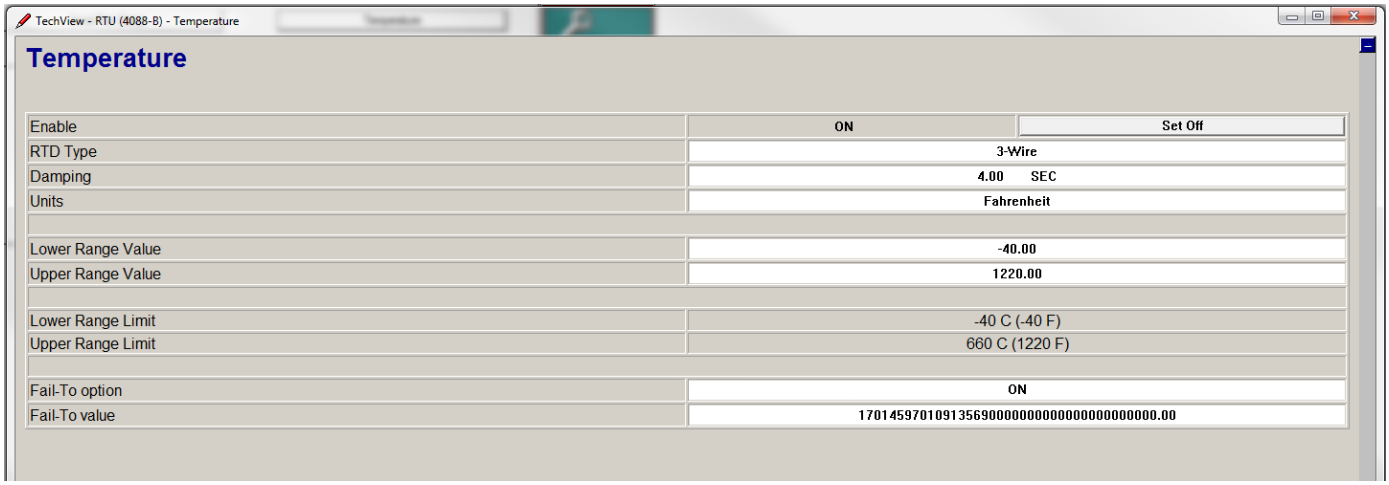


Figure 10-4. Configuring the Temperature Variable

1. Click **Temperature** to open the Temperature menu.
2. Click **Set On** to enable RTD conversion; click **Set Off** to disable RTD conversion.
3. Choose either **3-Wire** or **4-Wire** based on the type of RTD you are using.
4. Specify a **Damping** value from 0.0 (none) to 30.0 seconds. For a step change in input it takes five times the damping value for the reading to reach the new input. For example, an input change from 60 degrees to 70 degrees will take five seconds when damping is set to 1. Similarly, an input change from 60 degrees to 70 degrees will take 20 seconds when damping is set to 4.
5. Select the engineering **Units** for the temperature variable.
6. Specify the **Lower Range Value** (LRV). The LRV should be the lowest value for the temperature variable you want to measure for your process. This cannot be less than the **Lower Range Limit** (LRL) which represents the factory set lowest value for the range of values the sensor can read.
7. Specify the **Upper Range Value** (URV). The URV should be the highest value for the temperature variable you want to measure for your process. This cannot be more than the **Upper Range Limit** (URL) which represents the factory set highest value for the range of values the sensor can read.
8. If you want the sensor to report a preset temperature value if the RTD connection fails due an open or short, set the **Fail-To option** to **ON**, and enter the preset temperature value you want to use during a failure in the **Fail-To value** field.

10.1.4 Serial Port Setup

The Serial Port Setup menu lets you configure the RS-485 serial port for BSAP communication.

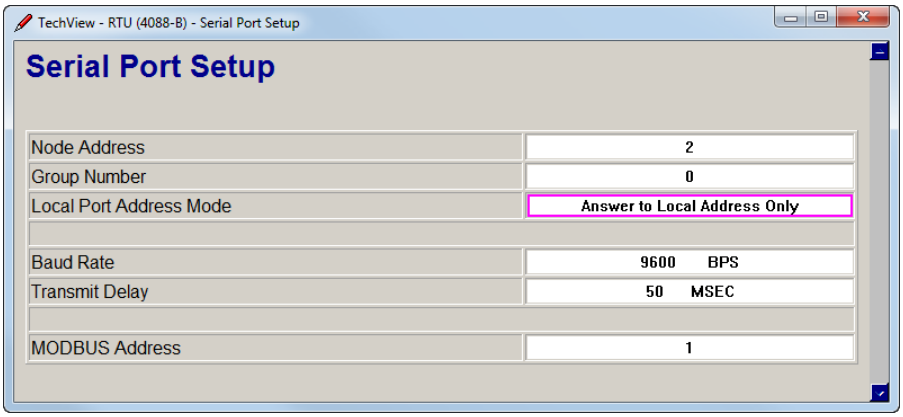


Figure 10-5. Configuring the Serial Port

1. Specify the BSAP local address for the sensor in the **Node Address** field.
2. If your network uses expanded BSAP addressing (EBSAP), enter the EBSAP group number in the **Group Number** field; otherwise set to 0.
3. Choose the **Local Port Address Mode**.
4. Specify the **Baud Rate** the serial port uses to communicate.
5. Specify the **Transmit Delay** in milliseconds. This is the amount of time the sensor will wait before it responds to a request.
6. Ignore the **MODBUS Address**; this is not useful for the 4088B.

10.1.5 Transmitter Data

The Transmitter Data menu shows certain identifying information about the sensor.

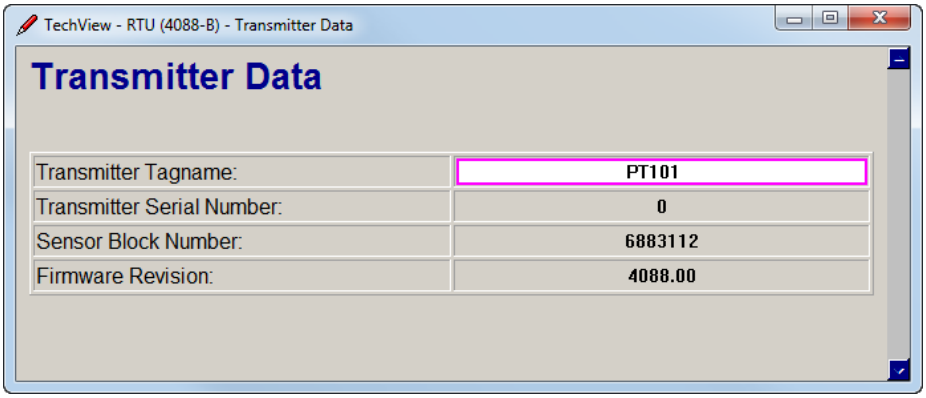


Figure 10-6. Viewing Transmitter Identification Information

Field	Description
Transmitter Tagname	Shows the user-configurable tag name for the transmitter.

Transmitter Serial Number	Shows the transmitter serial number.
Sensor Block Number	Shows the transmitter block number.
Firmware Revision	Shows the revision of firmware running in the transmitter.

10.1.6 RTD Coefficients

The sensor computes RTD resistance using the R0 value and the A and B coefficients in the modified DIN equation RT = R0 * (1+A*T+B*T^2). The sensor then calculates RTD temperature from the resistance.

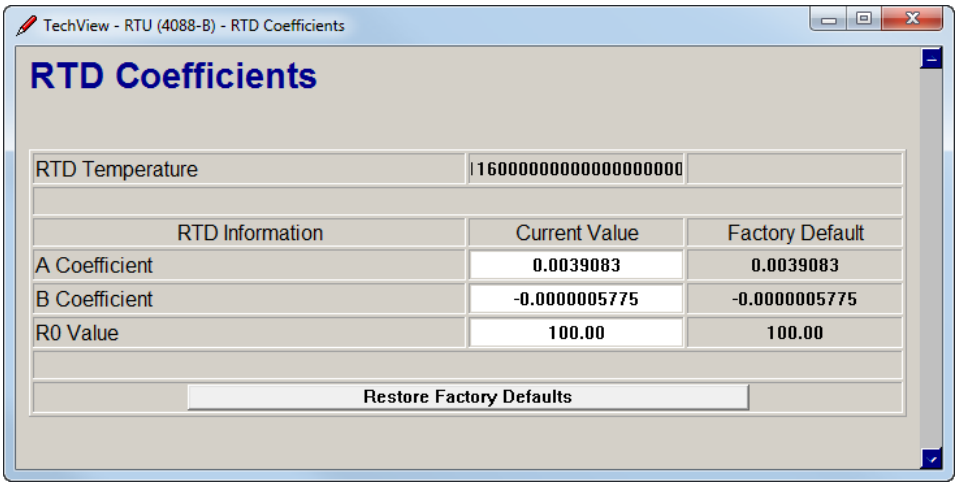


Figure 10-7. Configuring the RTD

Field	Description
RTD Temperature	The RTD temperature computed from the RTD resistance.
A Coefficient	Shows the A coefficient currently in use. If needed, you can specify a different A coefficient to use in the (A*T) term.
B Coefficient	Shows the B coefficient currently in use. If needed, you can specify a different B coefficient to use in the (B*T^2) term.
R0 Value	Shows the R0 value currently in use. If needed, you can specify a different R0 value to use in the equation.
Restore Factory Defaults	Click here to restore the factory default values for the A, B, and R0 coefficients. These are the coefficients for a platinum RTD with an "alpha" of 0.00385.

10.2 Calibrating the 4088B

Click the Calibration icon

to bring up the Calibration tabs.

10.2.1 Calibration of Gage or Differential Pressure

The **Sensor LRL** and **Sensor URL** display the lower-range limit and upper range limit, respectively, of the gage pressure / differential pressure sensor.

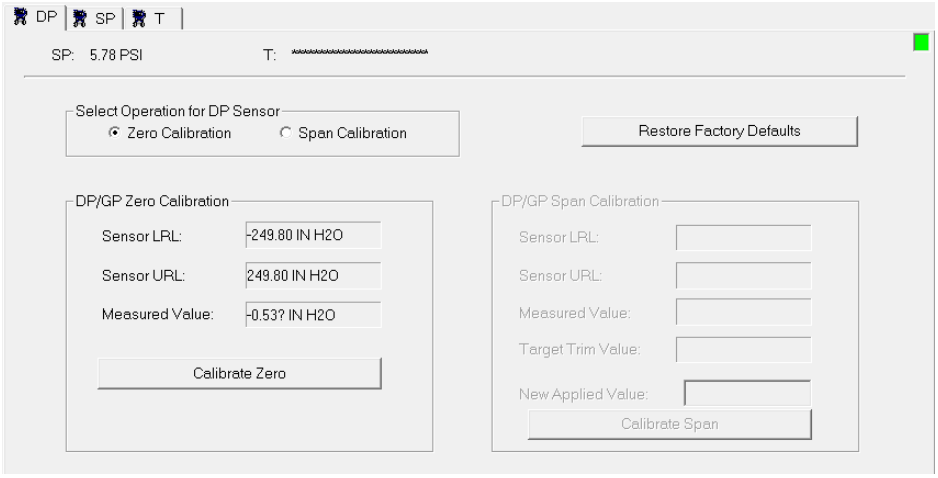


Figure 10-8. Calibrating Gage or Differential Pressure

1. In the "Select Operation for DP Sensor" box, select **Zero Calibration**.
2. To perform the zero calibration, vent the transmitter to atmosphere, so no pressure is applied. Click on the **Calibrate Zero** button, and the **Measured Value** will be trimmed to be as close to the zero as possible.
3. To calibrate the span, select **Span Calibration** in the "Select Operation for DP Sensor" box, then apply a pressure equivalent to the desired span. Now enter the pressure you applied in the **New Applied Value** field. If the transmitter accepts the **New Applied Value**, the value you entered will be displayed in the **Target Trim Value** field. This value must be less than or equal to the **Sensor URL** value. Click on **Calibrate Span**. The **Measured Value** will be trimmed to be as close to the desired span, as possible. **Note:** Span calibration may only be performed successfully if the applied pressure and span are within ±3% of one another.

Note: If, for some reason, you want to return to the calibration that was performed by the factory, click on **Restore Factory Defaults**.

10.2.2 Calibration of Static Pressure

Note: For static pressure calibration setup, connect identical supply pressures to both the low and high side ports of the MVT.

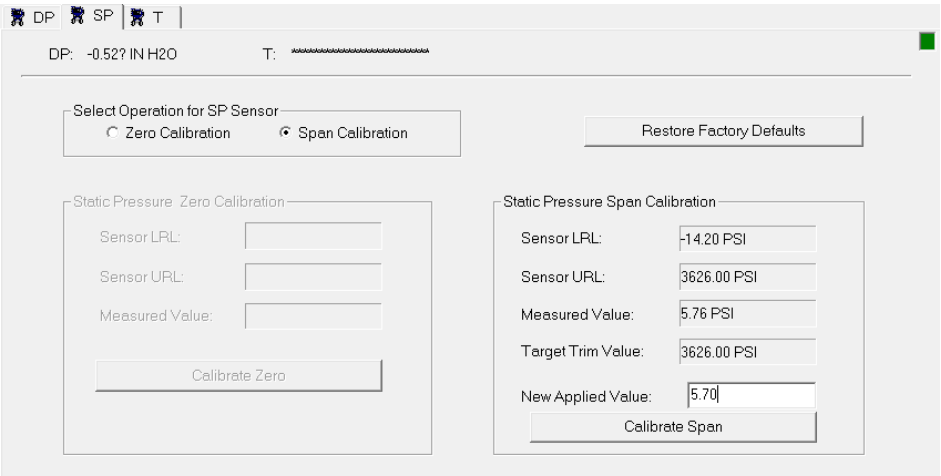


Figure 10-9. SP tab - Calibration of Station Pressure

The **Sensor LRL** and **Sensor URL** display the lower-range limit and upper range limit, respectively, of the static pressure sensor.

1. In the "Select Operation for SP Sensor" box, select **Zero Calibration**.
2. To perform the zero calibration, vent the transmitter to atmosphere, so only atmospheric pressure is applied. Click on the **Calibrate Zero** button, and the **Measured Value** will be trimmed to be as close to the zero as possible.
3. To calibrate the span, select **Span Calibration** in the "Select Operation for SP Sensor" box, then apply a pressure equivalent to the desired span. Now enter the pressure you applied in the **New Applied Value** field. If the transmitter accepts the **New Applied Value**, the value you entered will be displayed in the **Target Trim Value** field. This value must be less than or equal to the **"Sensor URL"** value. Click on **Calibrate Span**. The **Measured Value** will be trimmed to be as close to the desired span, as possible. **Note:** Span calibration may only be performed successfully if the applied pressure and span are within ±3% of one another.

Note: If, for some reason, you want to return to the calibration that was performed by the factory, click on **Restore Factory Defaults**.

10.2.3 Calibration of RTD Temperature

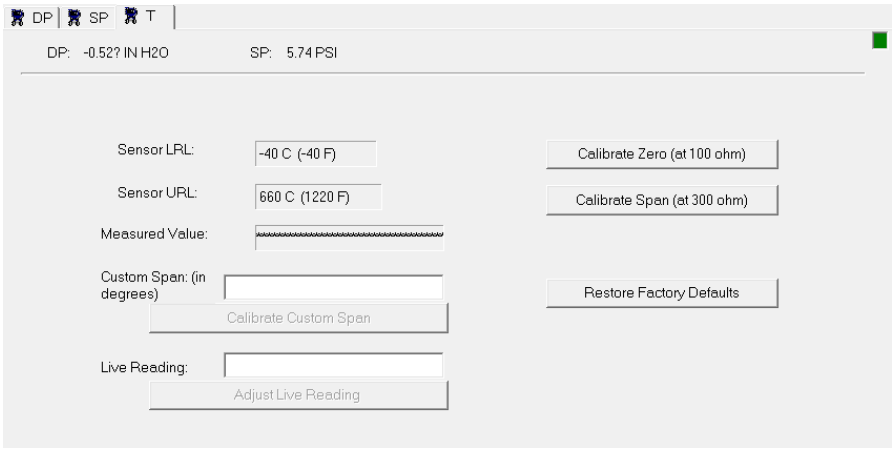


Figure 10-10. T tab – Calibration of RTD Temperature

1. Disconnect the regular RTD and connect a 100 Ohm (±0.01%) precision resistor across the RTD terminals (this is equivalent to 32°F).
2. Observe the **Measured Value** and wait for it to stabilize.
3. Click the **Calibrate Zero** button to calibrate the RTD zero.
4. Disconnect the resistor of step 1 and connect a precision resistor across the RTD terminals to represent your desired span.

   To calibrate to the default temperature span value of 558 °C (1036 °F) requires a resistance value of 300 ohms +/- 0.01%.

   To calibrate the temperature span to any other desired value, you must know the proper resistance value for that span. You must calculate this yourself or refer to a 100 ohm platinum RTD chart. For example, to calibrate the span to the upper range limit (URL) of the transmitter (660 °C, 1220 °F) requires a 332 ohm resistance +/- 0.01%. After you connect the required resistance, enter the desired temperature span value in the **Custom Span** field.
5. Observe the **Live Value** and wait for it to stabilize.
6. If you connected a 300-ohm resistance in step 4, click the **Calibrate Span (at 300 ohm)** button; if you connected any other resistance value click the **Calibrate Custom Span** button.
7. Disconnect the resistor, and reconnect the RTD.

Notes:

- If, for some reason, you want to return to the calibration that was performed by the factory, click on **Restore Factory Defaults**.
- To change the reading from the RTD for the 4088B, enter the desired reading (which should be similar to the actual reading, but presumably off slightly), and click on **Adjust Live Reading**.

Chapter 11 – Online Editing (ControlWave only)

TechView supports online editing of signal lists, and archive file structures in ControlWave-series controllers with version 04.60 (or newer) firmware.

In This Chapter

10.1 On-line Editing of Signal Lists....11-1
10.2 On-line Editing of Archive Files....11-4
10.2.1 Archive Fields....11-6
10.2.2 Batch Editing of Archive Files....11-7

11.1 On-line Editing of Signal Lists

Signal lists are a convenient way to organize and view signals used in your control strategy. For example, you might have a list of configuration parameters that apply to a particular portion of the control strategy; or you might have a list containing the current values of various process variables.

Note: Beginning with OpenBSI 5.8 Service Pack 1, lists can contain up to 10,000 signals; earlier versions limited this to 5000 signals.

If your controller is running a standard application, created by Emerson, certain signals will already be stored in signal lists for you to look at. You may decide, however, that there are other signals in the application that you want to add to an existing list, or maybe there are signals you want to remove from a list, because you don't use them much. These changes can be made via on-line signal list editing.

By default, online signal list editing is accessed by clicking on the **On Line Edits** group icon.

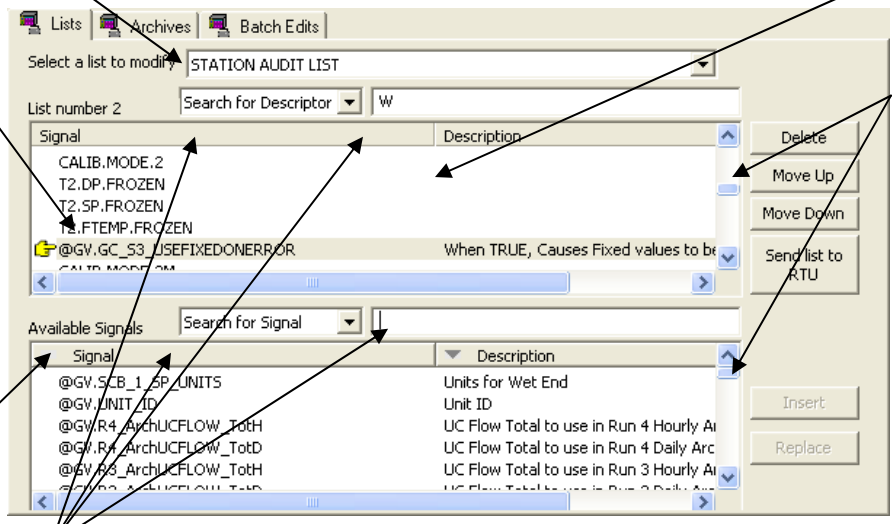

First, select the list you want to modify here.
If "Description" is blank, no description
These are all the signals in the currently selected list. Signals appear in the order they are defined in the list; you cannot sort them.
Use the scroll bars to bring additional signals into view.
You can sort the available signals alphabetically by signal name or descriptor by clicking on the label.
This is a list of other signals in the application that are available for you to add to the currently selected list.
You can search for particular signals based on their signal name or signal descriptor. Choose either "Search for Signal" or "Search for Descriptor" and type a partial signal name or descriptor;
TechView automatically scrolls the list to a matching signal or descriptor and displays a "hand icon" next to a matching signal.
= Sort alphabetically from top
= Sort alphabetically from bottom
Lists
Archives
Batch Edits
Select a list to modify
STATION AUDIT LIST
List number 2
Search for Descriptor
W
Signal
Description
CALIB.MODE.2
T2.DP.FROZEN
T2.SP.FROZEN
T2.FTEMP.FROZEN
@GV.GC_S3_USEFIXEDONERROR
When TRUE, Causes Fixed values to be
Delete
Move Up
Move Down
Send list to RTU
Available Signals
Search for Signal
Signal
Description
@GV.SCB_1_SP_UNITS
Units for Wet End
@GV.UNIT_ID
Unit ID
@GV.R4_ArchUCFLOW_TotH
UC Flow Total to use in Run 4 Hourly Ar
@GV.R4_ArchUCFLOW_TotD
UC Flow Total to use in Run 4 Daily Arc
@GV.R3_ArchUCFLOW_TotH
UC Flow Total to use in Run 3 Hourly Ar
Insert
Replace

Figure 11-1. Lists tab – Online Editing of Signal Lists

Field	Description
Select a list to modify	This box displays all the lists marked for on-line modification in the RTU. Lists are shown either by their list number, or a textual description. Choose the list you want to modify. This will be referred to as the "currently selected list".
Search for Signal / Search for Descriptor	To locate a particular signal (variable), you can search based on the signal name or the signal descriptor. Choose either **Search for Signal** or **Search for Descriptor** then enter partial search text in the search field to the right. TechView searches through the list and scrolls the window to the first match. It displays a hand icon next to the matching signal name or signal descriptor. (OpenBSI 5.8 and newer.)
List number *n*	This list shows all the signals included in the currently selected list you chose previously under **Select a list to modify**. Signals are displayed in the order they appear in the list, along with their associated signal descriptor, if configured. (If no signal descriptor was configured, the descriptor field is left blank.) If necessary, use the scroll bar to bring more signals from the list into view.
Available Signals	This is a list of all signals in the RTU that have been marked as "PDD", along with their associated signal description. (If no signal descriptor was configured, the descriptor field is left blank.) Any of these available signals may be added to the currently selected list, or may be used to replace a particular signal already in the list. You may sort the signals in this list either by signal name, or signal description by clicking on the "Signal" or "Description" titles at the top of the list box.
Delete	To remove one or more signals from the currently selected list, click on

	the signals to be removed, so they are highlighted, and then click on the **Delete** button. As in standard Windows, you can hold down the **Ctrl** key to select multiple signals, individually, or select the first signal in a range, and then select the final signal in the range while clicking on **Shift**. Once you click on **Delete** the highlighted signals will be removed from the currently selected list. **Note:** The signal is still in the control strategy file, but once you send the modified list to the RTU, it will no longer be part of this list.
Move Up	This button allows you to change the position of the currently selected signal so that is moved one position closer to the top of the list. Click on the signal you want to move, then click on **Move Up** and the signal will be moved one position up in the list.
Move Down	This button allows you to change the position of the currently selected signal so that is moved one position closer to the end of the list. Click on the signal you want to move, then click on **Move Down** and the signal will be moved one position down in the list.
Insert	This button allows you to add any signals selected from the **Available Signals** into the currently selected list. To do this, click on signals in the **Available Signals** box, so they are highlighted, then click on the **Insert** button. As in standard Windows, you can hold down the **Ctrl** key to select multiple signals, individually, or select the first signal in a range, and then select the final signal in the range while clicking on **Shift**. Once you click on **Insert** the signals will be added to the currently selected list. If a signal is already highlighted the list, TechView inserts the signals immediately below it. If no signal is highlighted in the list, or multiple signals are already highlighted in the list, TechView inserts the signals at the top of the list. If desired, you can move them, one at a time, to a different position in the list by clicking on the signal, then using the **Move Up** or **Move Down** buttons.
Replace	This button allows you to replace any signal in the currently selected list, with a signal from the **Available Signals** box. To do this, click on the signal you want to be replaced, in the currently selected list, so it is highlighted, then click on the signal you want to replace it with in the **Available Signals** box, then finally click on the **Replace** button. The highlighted signal in the currently selected list will be replaced with the highlighted signal from the **Available Signals** box.
Send list to RTU	When you have finished modifying the signal list, click on **Send list to RTU** and the modified list will be sent to the controller, thereby completing you online edits.

What if I'm not seeing any lists or signals at all?

You can only perform online editing for lists created with initialization files; lists generated with the LIST function block in ControlWave Designer cannot be edited online through TechView.

If, when you bring up the "Lists" on-line editing page, there are no signal lists in the **Select a list to modify** selection box, and consequently, no signals in the **Available Signals** list box, it's probably because your translation initialization file has not been properly specified for TechView.

To specify the translation initialization file, click on the Session Parameters icon, and click on **Next** in the Communications Setup dialog box. In the Node Setup dialog box, click on the Advanced Interface Setup button and specify the translation initialization file.

For details on the format of INI files, please see *Appendix A.*.

11.2 On-line Editing of Archive Files

Through on-line editing of archive files, you can:

- Change the number of records (rows) that will be saved in an existing archive file.
- Add, delete, or modify the column definitions for an existing archive file.

You **cannot**, however, create new archive files, nor can you edit saved archive file data.

Important

Archive files larger than 1 sector *cannot* be edited online. To determine whether or not your archive file exceeds 1 sector, please review the *Historical System* overview section of the ACCOL3 online help in ControlWave Designer.

The lists identified by the iiOutList and iiArchiveList parameters of the Archive function block must be modifiable, in order for your archive structure to be modified.

ASCII archive files (introduced in ControlWave firmware version 05.10) cannot be edited online.

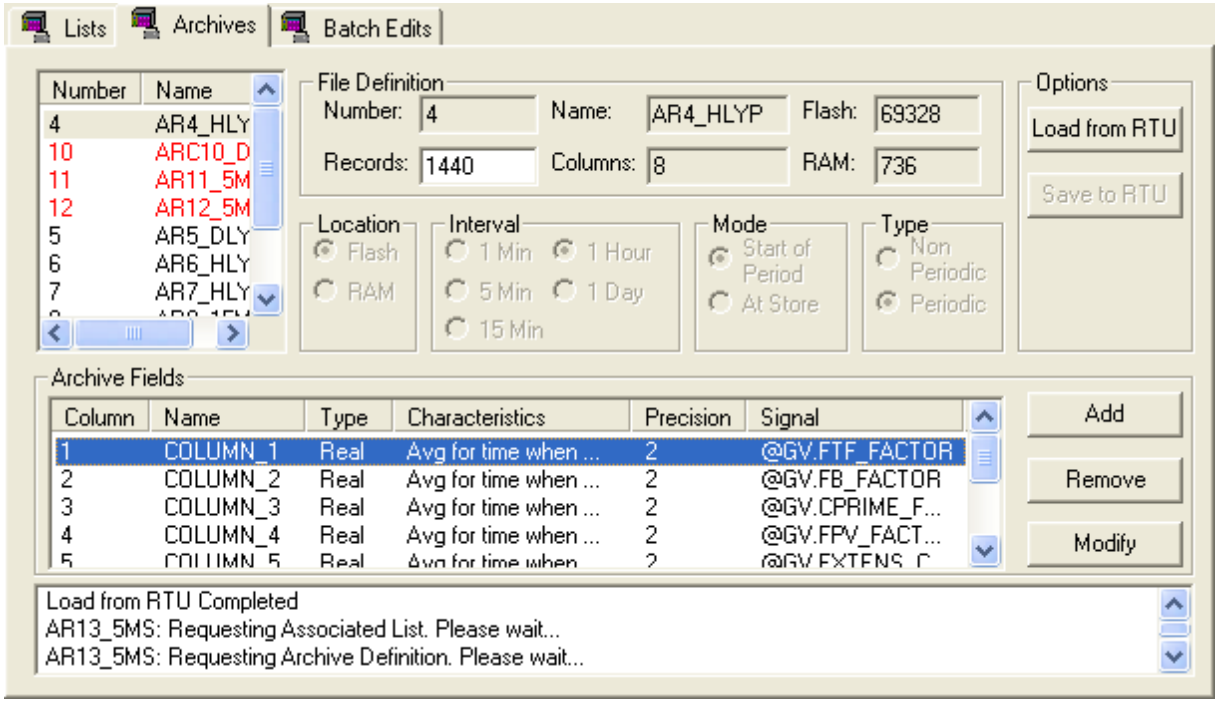


Figure 11-2. Archives tab – Online editing of Archives

When you call up the **Archives** tab, information on archive files is loaded. **Note**: If you see archive information colored red, there is a configuration error.

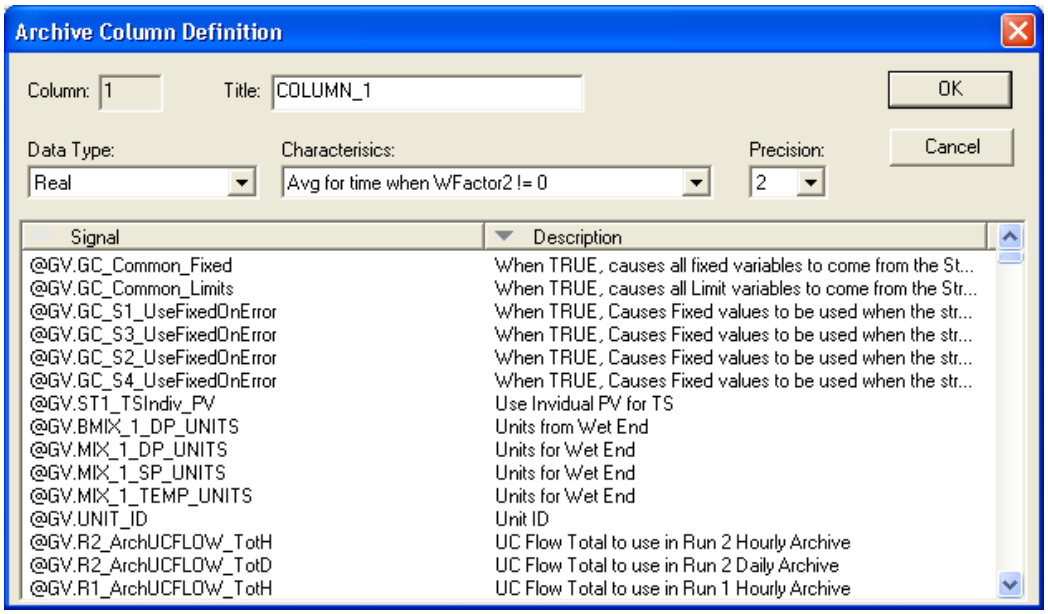
Field	Description
File Definition:	
Number	This displays the unique ID number for this Archive File. **Note:** *This cannot be changed via TechView.*
Name	This displays the archive file name. **Note:** *This cannot be changed via TechView.*
Records	This determines how many rows of "snapshot" data will be retained in this archive file. For example, if you want to save 24 rows (records) enter 24 here. The upper limit on the number of records is based on the size of each record. The total size of an archive file cannot exceed 74,000 bytes. This means that as the size of the archive record increases (based on number of columns, types of data, etc.) fewer records can be saved in the archive file. **Note:** Each archive record includes 14 bytes to store the timestamp and sequence numbers, in addition to the bytes used to store the actual column data.
Columns	This displays the number of columns in the archive file. The number of columns can range from 1 to 64.
Flash	Displays the amount of FLASH memory used for this archive file. **Note:** *This cannot be changed via TechView.*
RAM	Displays the amount of RAM memory used for this archive file. **Note:** *This cannot be changed via TechView.*
Location:	
Flash	If shown as selected, indicates this archive file will be saved in FLASH. **Note:** *This cannot be changed via TechView.*
RAM	If shown as selected, indicates this archive file will be saved in RAM. **Note:** *This cannot be changed via TechView.*
Interval:	
1 Min, 5 Min, 15 Min, 1 Hour, 1 Day	For certain modes, shows how often archive record "snapshots" are stored. **Note:** *This cannot be changed via TechView.*
Mode:	
Start of Period	When **Start of Period** is shown selected, the timestamp assigned to this archive record is the time at the beginning of the interval. **Note:** *This cannot be changed via TechView.*
At Store	When **At Store** is shown selected, the timestamp assigned to this archive record is the time at which the record is stored. **Note:** *This cannot be changed via TechView*.
Type**:**	
Non Periodic	When shown selected, archive records are stored when the ARCHIVE function block executes, *if* the criteria determined by the iiMode terminal is met. See the on-line help for the ARCHIVE function block, for details. **Note:** *This cannot be changed via TechView*
Periodic	When shown selected, archive records are stored when the ARCHIVE function block executes, *and* the chosen interval (either 1 minute, 5 minute, 15 minute, 1 hour, 1 day) has expired. See the on-line help for the ARCHIVE function block, for details. **Note:** *This cannot be changed via TechView.*
Archive Fields	See *Section 11.2.1.*

11.2.1 Archive Fields

To define a new column in the archive file, click on the **Add** button on the Archive tab. The Archive Column Definition dialog box opens. Make entries as described, below.

If you need to modify a column after you exit the Archive Column Definition dialog box, double-click on the column number in the list, or select the column number and then click on the **Modify** button to re-call the dialog box.

To delete an existing column, select the column number in the list in the lower right part of the Archive page, then click on the **Remove** button. The remaining columns will be renumbered automatically.



You can sort the available signals alphabetically by signal name or descriptor by clicking on the label.
= Sort alphabetically from top
= Sort alphabetically from bottom

Figure 11-3. Archive Column Definition

Field	Description
Column	This displays the number of the column you are defining; column numbers are assigned sequentially. **Note:** *This cannot be changed via TechView*
Title	Enter a description for the column here. It can range from 1 to 16 characters.
Data Type	Allows you to choose the data type of the variable associated with this column. This should match the data type configured for this variable in ControlWave Designer. **Note:** The choice of which variable is associated with a particular column is determined based on entries in the ARCHIVE function block, in your ControlWave project.
Characteristics	Determines the type of calculation to be performed on the collected data for this variable. Click on the **Characteristics** field and choose from the list box. For information on the different calculations, see the *Archive Configuration* section of the *ControlWave Designer Programmer's Handbook* (document# D5125)
Precision	Enter the number of spaces to the right of the decimal point that should be represented in the archive file for this signal value.
Signal	Select the name of the signal you want to map to this column of the archive file.

Description	Shows the descriptive text associated with this signal. (OpenBSI 5.8 Service Pack 1 and newer only.)

Click on **OK** to exit the Archive Column Definition dialog box.

11.2.2 Batch Editing of Archive Files

Batch editing is a way to save and retrieve Archive File Definitions and Signal List edits, for re- use in more than one RTU.

Note: Errors in any list/archive will cause cancellation of the batch operation.

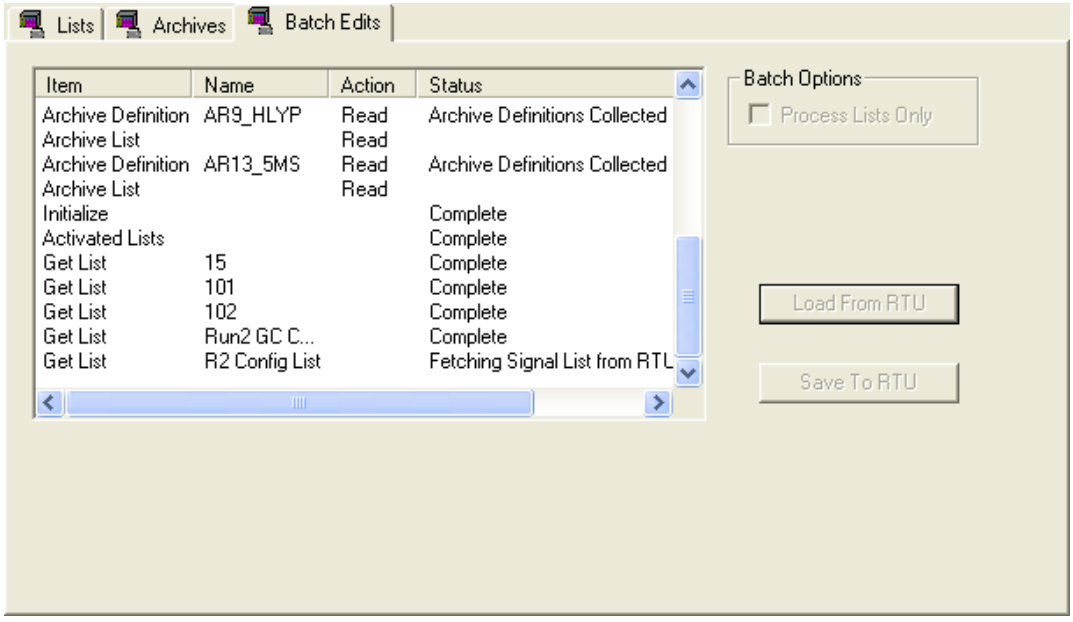


Figure 11-4. Batch Edits tab

Field	Description
Process Lists Only	When checked, archive files will **not** be included in the batch operation; only lists will be loaded or saved.
Load From RTU	To save archive file definitions and signal list definitions from the currently connected RTU into a file on your PC, click on this button. The Save As dialog box will appear and you will be prompted to specify a path and filename to hold the retrieved data.
[Save To RTU]	To write archive file definitions and signal list definitions to the currently connected RTU, click on this button. The Open dialog box will appear, and you will be prompted to locate the file on your PC holding the signal and archive data to be transferred.

Chapter 12 – Device and Measurement Groups

By default, the **Device** and **Measurement** groups contain links to web pages that are specific to particular platforms and applications, and so vary from system to system. As such, they are beyond the scope of this manual.

Appendix A -Initialization Files

TechView uses initialization files to determine the organization of screens, the PC applications that can be started from buttons, the HTML files that are accessible, which icons are used, etc.

If you purchased a standard application for your controller, it may come with its own set of predefined initialization files that are specific to that application. If that is the case, there is no need for you to edit initialization files.

Users can, however, modify many of the items in the initialization files to meet their specific needs. You can also create your own custom INI files. If you do this, you will need to specify them for TechView.

Beginning with OpenBSI 5.6 Service Pack 1, initialization files, web pages, etc. can be stored in a zip file in FLASH memory at each individual ControlWave-series controller. This allows a more customized application to be created that will automatically be uploaded to the PC when the user begins their TechView session.

To specify your own custom initialization files, or to specify the name of a zip file, click on the Session Parameters icon, and click on **Next** in the Communications Setup dialog box. In the Node Setup dialog box, click on the Advanced Interface Setup button and specify the appropriate file(s) in the Advanced Interface Setup dialog box.

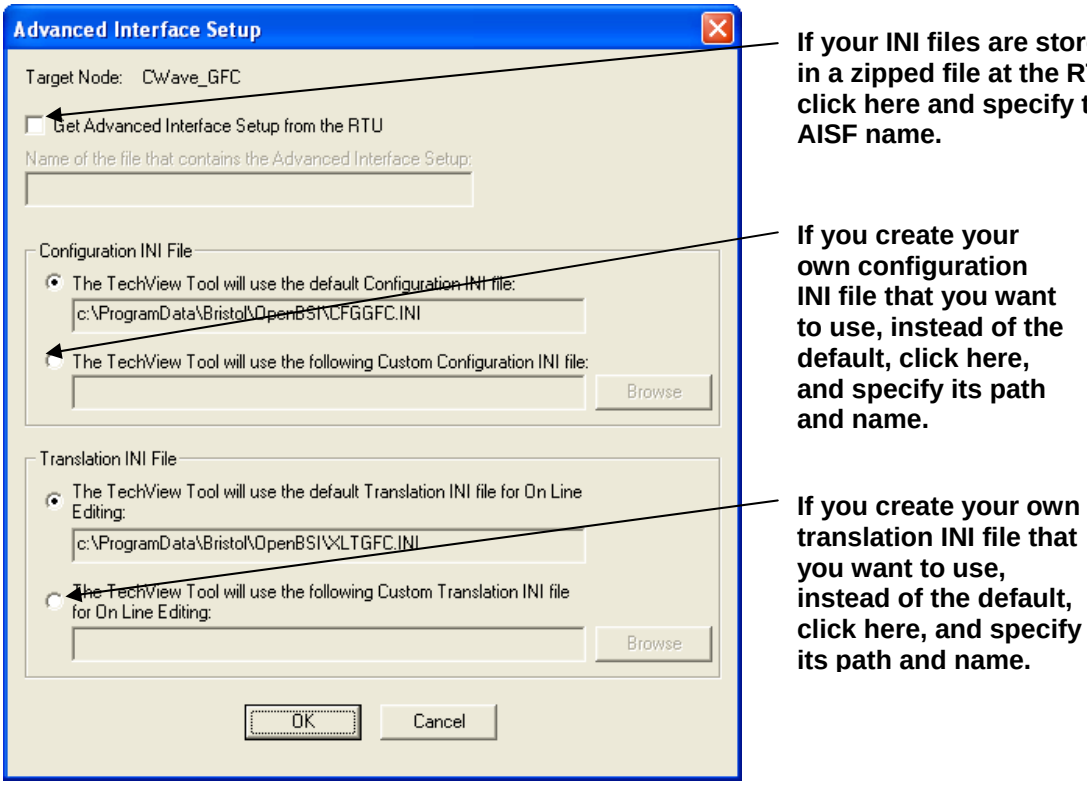

Advanced Interface Setup
Target Node: CWave_GFC
Get Advanced Interface Setup from the RTU
Name of the file that contains the Advanced Interface Setup:
Configuration INI File
The TechView Tool will use the default Configuration INI file:
c:\ProgramData\Bristol\OpenBSI\CFGGFC.INI
The TechView Tool will use the following Custom Configuration INI file:
Browse
Translation INI File
The TechView Tool will use the default Translation INI file for On Line Editing:
c:\ProgramData\Bristol\OpenBSI\XLTGFC.INI
The TechView Tool will use the following Custom Translation INI file for On Line Editing:
Browse
OK
Cancel
If your INI files are stored in a zipped file at the RTU, click here and specify the AISF name.
If you create your own configuration INI file that you want to use, instead of the default, click here, and specify its path and name.
If you create your own translation INI file that you want to use, instead of the default, click here, and specify its path and name.

Figure A-1. Advanced Interface Setup dialog box

Creating an Advanced Interface Setup File for Storage at the RTU

The Advanced Interface Setup File (AISF) allows a customized set of initialization files to be stored in the RTU's flash memory. This provides a mechanism for ensuring that the correct initialization files are used for a particular application and TechView session.

The Advanced Interface Setup File is a Zipped (compressed) file that contains several other files used with the application and TechView session. It includes:

Table A-1. Advanced Interface Setup File Components

Component:	Description:
AISF.TVS	This is a special TechView session file that identifies the startup web page, the configuration INI file, the translation INI file for this session, and any custom calibration signals.
configuration.INI	A configuration initialization file is tailored specifically to a particular session. It specifies which pages, icons, and applications can be started in a particular TechView session. The *configuration* must be replaced with the actual base name of the file.
translation.INI	A translation initialization file identifies which variables in an application are available for online editing, and also can be used to provide a textual description of a numbered list. The *translation* must be replaced with the actual base name of the file.
Web pages	The HTM, HTML pages for configuration/calibration, etc. associated with this particular application.

To create an Advanced Interface Setup Zip File for a custom application:

1. Create a configuration.INI file for the application. See Configuration Initialization (*.INI) Files (Platform-dependent) later in this section.
2. Create a translation.INI file for the application to support online editing of lists. See Translation.INI Initialization Files later in this section.
3. Create an AISF.TVS file, according to the AISF.TVS File Format description, later in this section.
4. Use a ZIP compression program, such as Winzip, to combine all these files, along with the web pages for the application, together into a single ZIP file named AISF.ZIP. If you want to download it using the 1131 Downloader, it must be stored in the following folder:

\ProgramData\Bristol\OpenBSI\projects*project_name*\C*resource_name*\R\RTU_RESOURCE

Note: If you use a name other than AISF.ZIP, it will NOT be included in the download.

5. Download the ZIP file, along with the bootproject, to your ControlWave controller using the OpenBSI 1131 Downloader. Be sure you check the **zipfile** option in the Downloader. (**Note**: The

File Transfer control may also be used to transfer the ZIP file, separately, but it cannot be used to transfer the bootproject.)

6. Open the session file (.TVS) on your PC that you want to configure. (**Note:** This is not the AISF.TVS file mentioned above.) In the Advanced Interface Setup dialog box, check the **Get Advanced Interface Setup from the RTU** box, and specify the name of the ZIP file you defined in Step 4.

Once you've completed these steps, TechView automatically uploads the appropriate web pages, and initialization files to your PC. In subsequent sessions, TechView prompts you as to whether you want to use the files for this RTU already on the PC, or you want to upload the files from the RTU. (This prompt may be disabled by un-checking the **Show Advanced Interface Setup File Detection Dialog** option in the Application Settings dialog box. TechView performs a validation on the files before it uses them.

Because some filenames, such as AISF.TVS, are shared among more than one RTU, files from each RTU are stored on the PC in their own folder, named after the application program running in the RTU. These folders are sub-folders of the \ProgramData\Bristol\OpenBSI\TechView_AISetup folder.

AISF.TVS File Format

The AISF.TVS file must follow the format shown, below:

```
[PARAMETERS]
MODE=4
DESCRIPTION=Calibration
WEB_PAGE=startup_web_page

[RTU]
MFPRUNS=meter_runs
INTERNAL_XMTR=present
CUSTOM_CFGINI=cfg_ini_filename
CUSTOM_XLTINI=translate_ini_filename

[RTU_CALIB_SIGNALS]
Calib_keyword1=calib_signal1
Calib_keyword2=calib_signal2
 :
Calib_keywordn=signaln
```

where:

`MODE=4`	must be entered exactly as shown.
`DESCRIPTION=Calibration`	must be entered exactly as shown.
startup_web_page	identifies the first start-up web page for this session. If not specified, the default web page for this RTU type is included. The startup web page must be included in the AISF zip file in the RTU.
meter_runs	specifies the number of meter runs in this particular application. This takes precedence over the number of meter runs configured for the session. If not specified, however, the number configured for the session will be used.
present	identifies whether or not this RTU has an internal transmitter. A value of "1" indicates an internal transmitter is present. A value of "0" indicates there is no internal transmitter. This entry is ignored if the RTU is a ControlWave XFC (which always has an internal transmitter), or if the RTU does not support a "wet end". If the "INTERNAL_XMTR" keyword is omitted, session parameters will be used instead.
cfg_ini_filename	identifies the Configuration initialization (*.INI) file used for this session. If nothing is specified, this would be the default configuration INI filename for this RTU type. *cfg_ini_filename* must exist in the AISF zip file in the RTU.
translate_ini_filename	identifies the Translation initialization (*.INI) file used for this session. If nothing is specified, the current translation INI filename for this session would be used. *translate_ini_filename* must exist in the AISF zip file in the RTU.
Calib_keyword1=calib_signal1 *Calib_keyword2=calib_signal2* : *Calib_keywordn=calib_signal*n	specifies the calibration signals to be used if this RTU includes an internal or external transmitter. If nothing is specified, the factory default calibration signal names will be used. TechView will only examine this section if *meter_runs* is configured. The *calib_keyword* and *calib_signal* vary depending upon the type of RTU and

application.

Example AISF.TVS file:

```
[PARAMETERS]
MODE=4
DESCRIPTION=Calibration
WEB_PAGE=MY_GFCPAGE.HTM

[RTU]
MFPRUNS=2
INTERNAL_XMTR=1
CUSTOM_CFGINI=CFGINI.INI
CUSTOM_XLTINI=TRANSLAT.INI

[RTU_CALIB_SIGNALS]
Mode=@GV.CALIB_MODE
ExecOper=@GV.MIX_1_CALIBOP
DP=@GV.MIX_1_DP
DpApplied=@GV.MIX_1_DPSPAN
DpRestore=@GV.MIX_1_RESTOREDP
SP=@GV.MIX_1_SP
SpApplied=@GV.MIX_1_SPSPAN
SpRestore=@GV.MIX_1_RESTORESP
RTD=@GV.MIX_1_RTD
RtdApplied=@GV.MIX_TO_APPLIED
RtdRestore=@GV.MIX_1_RESTORERTD
DPDampFactor=@GV.MIX_DP_DAMP_FACTOR
Status=@GV.MIX_1_LASTCALBOP
```

Configuration Initialization (*.INI) Files (Platform-dependent)

TechView includes several default configuration initialization files that are tailored for specific hardware platforms and software applications. Users can modify them, or use them as a basis for creating customized initialization files.

The default initialization files included in the TechView package are named, as follows:

Default INI Filename:	Type of RTU:
CFG3508.INI	3508 transmitter
CFG3808.INI	3808 transmitter
CFG4088B.INI	4088B transmitter
CFGATF1.INI	Teleflow 1 run load
CFGATF2.INI	Teleflow 2 run load
CFGCTF.INI	C-based Teleflow
CFGATC1.INI	Telecorrector

CFGTR2.INI	2 sensor Telerecorder
CFGTR4.INI	4 sensor Telerecorder
CFGEFM.INI	ControlWave EFM unit
CFGGFC.INI	ControlWave GFC unit
CFGXFC.INI	ControlWave XFC unit

Note: In addition to these names, if you create your own file for the ControlWave or ControlWave MICRO platform, default names of CFGCW.INI and CFGCWM.INI will be assigned, respectively. There are no standard files for these two platforms, however.

The basic syntax of an initialization file is as follows:

```
[Applications]
Title=global_title_bar
Button1=title_in_menu_1
Link1=application_1
Button2=title_in_menu_2
Link2=application_2
 :         :
Buttonn=title_in_menu_n
Linkn=application_n

[Groups]
ExclCalibGroup=hide
StartupGroup=first
Group1=group1_section
Group2=group2_section
     :     :
Groupn=groupn_section

[groupn_section]
ExcludePageImage=hide_image
Name=group_name
VisibilityState=default_state
Image=group_icon_number
```

Calib=*include_in_this_group*

Page1=*page1_section*

Page2=*page2_section*

: :

Page**n**=*page**n**_section*

[*page**n**_section*]

Units=*units*

Name=*tab_name*

Type=*page_type*

Image=*page_icon_number*

Control=*control_type*

Button1=*button1_label*

Link1=*link1*

Title1=*title1*

State1=*state1*

Parameters1=*par1_1=val1_1;par1_2=val1_2;…. par1_n=val1_n*

Units1=*units1*

Position1=*x1,y1*

Size1=*width1,height1*

Button2=*button2_label*

Link2=*link2*

Title2=*title2*

State2=*title2*

Parameters2=*par2_1=val2_1;par2_2=val2_2;…. par2_n=val2_n*

Units2=*units2*

Position2=*x2,y2*

Size2=*width2,height2*

: :

Button***n***=*button**n**_label*

Link**n**=*link**n***

Title**n**=*title**n***

State**n**=*state**n***

Parameters***n***=*par**n**_1=val**n**_1;par**n**_2=val**n**_2;…. par**n**_n=val**n**_n*

Units***n***=*units*n

Position***n***=*x*n, *y*n

Size***n***=*width*n,*height*n

where:

[Applications]	The [Applications] section of the file defines which applications appear in the pop-up menu for the RTU's icon in the TechView tree.
Title=*global_title_bar*	You can control the text displayed in the title bar of the web page by entering it in *global_title_bar*. Individual web pages may override this setting or append to it. If *global_title_bar* is preceeded by the "^" character, the individual page title appends to the *global_title_bar* instead of overwriting it entirely. (OpenBSI 5.8 and newer.)
Button*1*=*title_in_menu_1* Button*2*=*title_in_menu_2* : Button*n*=*title_in_menu_n*	*title_in_menu_n* is the name that will appear in the pop-up menu for the user to select when starting an application. There must be one button *n* for each application you want to appear in the pop-up menu. The first *n* must be the integer "1" and additional buttons must be numbered consecutively from that point.
Link*1*=*application_1* Link*2*=*application_2* *:* Link***n***=*application_n*	*application* is the command line argument for starting the application associated with button *n* in the pop-up menu. The command line argument may just be the name of the program executable, or it may optionally also include other switches or command line parameters.
[Groups] Group1=*group1_section* Group2=*group2_section* : Group*n*=*group**n**_section*	The [Groups] section defines the groups that appear in the Group control pane. *group1_section* through *group**n**_section* are the names of these group sections. By default, these names are also used as the names of the icons for the respective group.

`ExclCalibGroup`=*hide*	This line may optionally be included to hide the calibration group. If *hide* is set to "1", the calibration group will be hidden. If *hide* is set to "0" or if the ExclCalibGroup is not included, the Calibration Group will be present by default.
`StartupGroup`=*first*	This optional line specifies the group number that is active when TechView is first started, i.e. the page that is on top among all the groups. By default, this is 0 (Calibration Group).
[*group**n**_section*]	The *group**n**_section* must be one of the group section names defined previously in the [Groups] section.
ExcludePageImage=*hide_image*	Optionally set *hide_image* to -1 to prevent display of icons on the tabs for this group. (OpenBSI 5.8 Service Pack 1 and newer.)
`name`=*group_name*	*group_name* optionally defines the name appearing under the icon for this group. If not specified, the name for *group_**n**_section* will appear under the icon (default).
`VisibilityState`=*default_state*	*default_state* specifies the default web page initial appearance for this group. You can override the setting for an individual web page in the group using the State*n* keyword. Valid *default_state* values are: Minimized - The web page initially shows minimized Maximized – The web page initially shows maximized Normal – TechView determines the size and position of the web page. (default) (OpenBSI 5.8 and newer.)
`Image`=*group_icon_number*	*group_icon_number* is used to choose which icon will be displayed in the Group control for this group. A table of available icons is included at the end of this section.
`Calib`=*include_in_this_group*	specifies that the calibration pages should appear in this group. The pages will be appended to this group.
`page1`=*page1_section* `page2`=*page2_section* *:*	*page1_section …page**n**_section* are used to reference the page definitions for pages in this group. In addition, these are the default names that will appear on the tabs for the pages, if

page***n***=*page**n**_section*	no other names are chosen.
[*page**n**_section*]	defines the buttons or controls that will appear on this page. *page* must have been defined earlier under *groupname*.
Image=*page_icon_number*	*page_icon_number* is used to choose which icon will be displayed on the tab for this page. A table of available icons is included at the end of this section. Beginning with OpenBSI 5.8 Service Pack 1, you can hid the page icon for this tab by specifying "-1" for the page_icon_number.
Units=*units*	Specifies a default unit of measurement to be used when sizing the height and width of web pages. *units* can be any one of the following: pixels inches centimeters **Note:** This field is overridden by any entry made for *Units_n* for an individual button/link.
name=*tab_name*	*tab_name* optionally defines the name appearing on the tab for this page. If not specified, the name for *page**n**_section* will appear (default).
Type=*page_type*	Optionally specifies the page type. If "1" (default if no type specified) this page consists of buttons to activate external web pages or WINUOI pages. If "2"this page includes one of the TechView ActiveX controls (See *control_type* below). If "3" this page can start a Windows application.
Control=*control_type*	*control_type* is only necessary if "Type=2". In this case there are three possible choces for *control_type* 1 = On Line Editing Archive Control 2 = On Line Editing List Control 3 = On Line Editing Batch Control
Button1=*button1_label* : Button***n***=*button**n**_label*	*button**n**_label* entries define the text labels that appear on the buttons on this page.

Link1=*link1* : Link***n***=*link**n***	*link**n*** entries define the web pages or applications associated with the corresponding button label(s) on this page. If referring to an application (the page TYPE = "3"), this must be the absolute path of the Windows™ application to be started by this button.
Title1=*title1* : Title***n***=*title**n***	*title**n*** entries define text that appears in the title bars of web associated with the corresponding button label(2) on this page. Titles defined here override the *global_title_bar* setting defined in [Applications], or if the *global_title_bar* entry includes is preceded by a "^" character, *title**n*** entries append to the *global_title_bar* entry. If you specify the Title*n* keyword but don't specify text for the title, the command uses the *button**n**_label* text. (OpenBSI 5.8 and newer.)
State1=*state1* : State***n***=*state**n***	*state**n*** specifies the initial appearance for the web page called up from this button.. *state**n*** overrides the group-level VisibilityState setting for this individual web page. Valid *state* values are: Minimized - The web page initially shows minimized Maximized – The web page initially shows maximized Normal – TechView determines the size and position of the web page. (default) (OpenBSI 5.8 and newer.)
Parameters1=*par1_1..val1_1;* *par1_n=val1_n* : Parameters*n=par**n**_1..val**n**_1;* *par**n**_n=val**n**_n*	The entries define parameters and their associated values that are to be passed to the HTML page identified by the corresponding Link keyword. The entries will be stored in memory as a "cookie" named "TechView". To retrieve the parameters and their values, the HTML page must include Java script code to access the cookie, and parse the parameters. If there is more than one parameter for a given link, it must be separated from the next one by a semicolon ";".
Units1=*units1* Units2=*units2*	*units* specifies the unit of measurement for a particular web page's width and height. *units* can be

: `Units`***n***`=`*units*n	any of the following: pixels inches centimeters **Note:** This field overrides any entry made for *Units* at the page level.
`Position1=`*x1,y1* `Position2=`*x2,y2* : `Position`***n***`=`*x*n	These specify the x and y coordinates of the top left corner of the web page. Coordinates are relative to the screen so a value of 0,0 specifies that the web page will appear at the top left corner of the screen. If not specified the web page will be centered on the screen.
`Size1=`*width1,height1* `Size2=`*width1,height1* : `Size`***n***`=`*width*n,*height*n	These specify the width and height of the web page in units specified by the *units*n or *units* keywords. If neither of these keywords are specified, pixels will be used. The size keywords override State and VisibilityState keywords when a page is restored after its initial appearance.

The *group_icon_number* and *page_icon_number* specify which icon will be used for the group and the Property Sheet page's tab. nothing is specified, index 16 will be used. The following table, lists all the available stock icons:

Icon number	Associated icon
1	
2	
3	
4	
5	
6	
7	

8	
9	
10	
11	
12	
13	
14	
15	
16	

Excerpts from a sample INI file are shown on the next page.

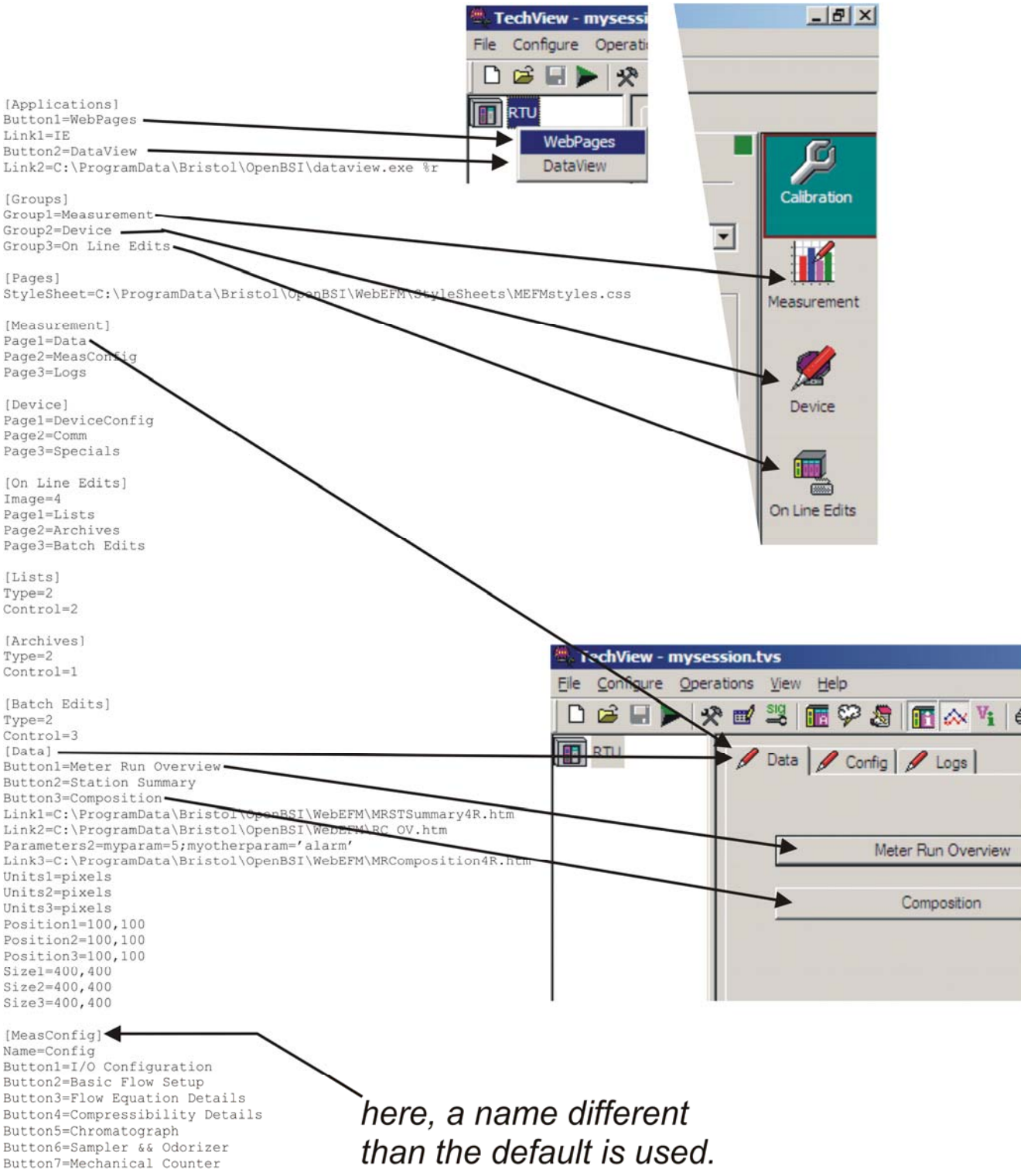


Figure A-2. Sample INI File

LISTS.INI

The _LISTS.INI file identifies the contents of signal lists in the RTU, and also marks which lists are available for on-line editing.

***LIST** *listnumberx editable*

variable1

variable2

:

variablen

where:

listnumber is the number used to identify this list.

editable is either not-present, indicating the list cannot be edited, or is replaced with the letter "M" meaning that the list can be modified on-line.

variable1-n are the variables in the list.

For example, LIST 1 below, cannot be edited on-line, whereas LIST 7 below can be edited on-line:

```
*LIST 1
@GV._AI_FOR_NON_ALARMS
@GV._ALARMS_BSAP_PORT1
@GV._ALARMS_BSAP_PORT1
@GV._ALARMS_BSAP_PORT10
@GV._ALARMS_BSAP_PORT11
@GV._ALARMS_BSAP_PORT11
@GV._T16_AVG_DUR


*LIST 7 M
@GV.RealVar101
@GV.RealVar102
```

```
@GV.RealVar103
@GV.RealVar104
@GV.RealVar105
@GV.RealVar106
@GV.RealVar107
@GV.RealVar108
```

TRANSLATION.INI Initialization File

Many of the standard application programs shipped with particular controllers include a TRANSLATION.INI file, that is used to support on-line editing of signal lists. The TRANSLATION.INI file lists all signals marked as "PDD" within the ControlWave application, and therefore, the "pool" of variables that are available to be added to lists during on-line editing.

In addition, it optionally includes descriptive information that may be used for list selection, in lieu of the actual list number, or variable name.

Notes:

- You can have the Signal Extractor program generate the TRANSLATION.INI file automatically. To do this, select the **Produce On-Line Edit Translation File** box in the Signal Extractor. For more information on the Signal Extractor, see *Chapter 12* of the *OpenBSI Utilities Manual* (D5081).
- If your ControlWave project includes multiple configurations or resources, and you use the Signal Extractor to generate the TRANSLATION.INI file, select the **Add 1131 Configuration name**… option from the Applications page of the Advanced Configuration utility to append the configuration and resource name to the LOAD name used in the TRANSLATION.INI file. For example, if the project MYPROJ has a resource named CW1, the LOAD name is MYPROJ_CW1. This option is supported in OpenBSI 5.8 Service Pack 1 and newer versions. See *Appendix E* of the *OpenBSI Utilities Manual* (D5081) for more information.

The basic syntax of the TRANSLATION.INI file is as follows:

```
[AVAILABLE SIGNALS]
SIG_1='signal_name_1'
SIG_2='signal_name_2, signal_description_2'
SIG_3='signal_name_3, signal_description_3'
  :
```

```
SIG_n='signal_name_n'

[LIST_DESCRIPTIONS]
LIST_1=description_for_list_1
LIST_2=description_for_list_2
  :
LIST_n=description_for_list_n

[PROJECT_NAME]
LOAD=identifier
```

where:

`SIG_1='signal_name_1'`
`:`
`SIG_n='signal_name_n'`
	are the variables marked as PDD in your ControlWave project.

signal_description_1 `:` *signal_description_n*	OPTIONAL - allows a description of the signal. The description is separated from the *signal_name* by a comma, and must appear between the single quotation marks used for the *signal_name*.
`LIST_1=`*description_for_list_1* `::` `LIST_n=`*description_for_list_n*	are descriptions of lists.
`LOAD=`*identifier*	specifies which standard application is being used. The *identifier* must match the first eleven characters of the MWT file name. This same *identifier* must also be reflected in the first eleven characters stored in the _CW_LOAD_STR system variable. If you use multiple configurations/resources in your project, you should include the configuration / resource name as part of the identifier to distinguish them from one another.

Important

On-line list editing requires that the LOAD=*identifier* be set correctly. If *identifier* does NOT match the first eleven characters of the MWT file name (which is also the first eleven characters of the _CW_LOAD_STR created via the System Variable Wizard), no on-line list editing will be possible. In addition, any list to be available for

on-line editing must be created via the DBLOAD function block; you cannot perform on-line editing in TechView to lists created with LIST function blocks.

A sample TRANSLATION.INI file is shown, below:

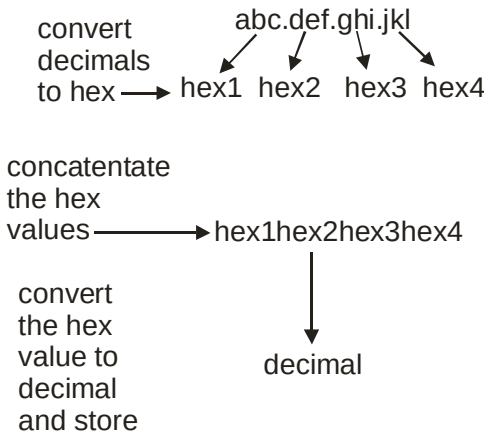
```
[AVAILABLE_SIGNALS]
SIG_1='@GV._FL_HIST_USAGE'
SIG_2='@GV._FL_HIST_FREE'
SIG_3='@GV._FP_ERR_SC'
SIG_4='@GV._SUSP_PERCENT'
SIG_5='@GV._CPU_BUSY_P1'
SIG_6='@GV._EXP_HEART_BEAT'
SIG_7='@GV._USE_ACCOL_NAME'
SIG_8='@GV._AI_FOR_NON_ALARMS'
SIG_9='@GV._LOCAL_ADDRESS'
SIG_10='@GV._EBSAP_ADDRESS, GROUP_NUMBER'
SIG_11='@GV._HEAP_CUR_FREE'
SIG_12='@GV._HEAP_BLK_FREE'
SIG_13='@GV._HEAP_START_FREE'
SIG_14='@GV._HEAP_RBLK_FREE'
SIG_15='@GV._SLAVE_PORT'
SIG_16='@GV._MSG_TIMEOUT, MESSAGE_TIMEOUT'
SIG_17='@GV._NEW_NRT_RCVD'
SIG_18='@GV._SLAVE_DEAD'
SIG_19='@GV._SLAVE_POLL_DIS'
SIG_20='@GV._DLM_PORT'
SIG_21='@GV._DLM_R_PTR'
SIG_22='@GV._DLM_READ'
SIG_23='@GV._DLM_WRITE'
SIG_24='@GV._ALM_RETRIES'
SIG_25='@GV._ALM_RET_ACT'
SIG_26='@GV._ALM_RET_DEAD'
SIG_27='@GV._ETH_POLL_PER'
SIG_28='@GV._ETH1_ACT'
SIG_29='@GV._ETH2_ACT'
SIG_30='@GV._ETH3_ACT'
SIG_31='@GV._NHP_IGNORE_NRT'
SIG_32='@GV._NHP_IGNORE_TS'
SIG_33='@GV._BSAP_FLAG_SENSE'
SIG_34='@GV._NHP_ADDITIONAL_MASK'
SIG_35='@GV._TS_DELTA_ACCURACY'
SIG_36='@GV._P1_POLL_PER'
SIG_37='@GV._P1_WRITE_DEL'
SIG_38='@GV._P1_WRITE_TMO'
SIG_39='@GV._P1_IGNORE_ECHO'
SIG_40='@GV._P1_TS_DIS'
```

```
SIG_41='@GV._P1_TS_FORCE'
SIG_42='@GV._P1_NRT_DIS'
SIG_43='@GV._P1_ALM_DIS'

[LIST_DESCRIPTIONS]
LIST_1=LIST1
LIST_2=LIST2
LIST_3=LIST3
LIST_4=LIST4
LIST_100=UnknownList

[PROJECT_NAME]
LOAD=EditArchive
```

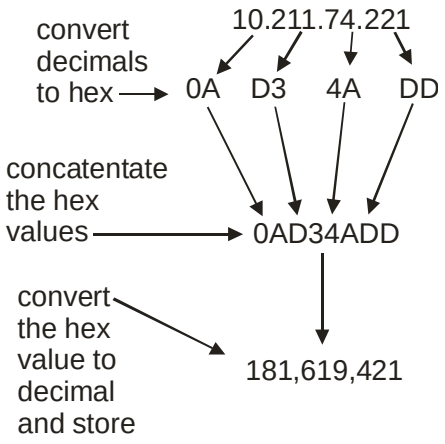
Notes about IP Address Formats in TVS Files

IP addresses are not stored in dotted decimal format within the TEMP.TVS file; instead, a conversion is performed.

Each of the four decimal numbers in the dotted decimal IP address is converted to a hex number. The four hex numbers are then concatenated, and then the resulting hex number is converted to decimal, and then stored in the TVS file.



For example, if you have an IP address of 10.211.74.221, convert the four portions of the IP address to their hex equivalents, which are: 0A D3 4A and DD respectively. Then concatenate those values together (0AD34ADD) and convert it to decimal, which is 181,619,421.


10.211.74.221
convert
decimals
to hex
0A
D3
4A
DD
concatentate
the hex
values
0AD34ADD
convert
the hex
value to
decimal
and store
181,619,421

Index

A

Advanced Communication Parameters dialog box
BSAP ... 3-4
IP ... 3-7
Analog output
calibration in 3808 ... 7-5
Application Settings dialog box ... 4-3
General tab ... 4-7
Security tab ... 4-7
Startup tab ... 4-4
Applied Value ... **5-1**
Archive Files
deleting ... 4-13
online editing of ... 11-4
As Found As Left
defined ... 5-3
Audit note
writing an ... 4-12
Audit records
deleting ... 4-13

B

BSAP local address
changing the ... 4-11

C

Calibration
equipment ... 5-5
modifying signal names used for ... 4-8
of analog output in 3808 ... 7-5
of differential or gage pressure in 3508 ... 6-1
of differential or gage pressure in 3530 ... 8-1
of differential or gage pressure in 3808 ... 7-1
of differential or gage pressure in 4088B ... 10-7
of differential or gage pressure in ControlWave EFM,GFC,XFC ... 9-1
of RTD Temperature in 3508 ... 6-5
of RTD Temperature in 3530 ... 8-4
of RTD Temperature in 3808 ... 7-3
of RTD Temperature in ControlWave EFM, GFC, XFC ... 9-6
of static pressure in 3508 ... 6-3
of static pressure in 3530 ... 8-2
of static pressure in 3808 ... 7-2
of static pressure in 4088B ... 10-7
of static pressure in ControlWave EFM,GFC,XFC ... 9-4
of TeleRecorder inputs in 3530-45B and -55B 8-7
overview ... 5-1
Calibration mode ... 5-7
Calibration Setup page ... 3-10
Communication
port considerations ... 5-4
viewing statistics ... 4-13
Communication Setup page
BSAP ... 3-2
IP ... 3-3
Configuration
of 4088B ... 10-1

D

Damping
defined ... 5-3
of output in 3530 ... 8-6
of output in ControlWave EFM,GFC,XFC ... 9-11
Deleting historical data ... 4-13
Device group ... 12-1
Devices supported by TechView ... 1-1
Dial Parameters ... 3-6
Differential pressure
calibration in 3508 ... 6-1
calibration in 3530 ... 8-1
calibration in 3808 ... 7-1
calibration in 4088B ... 10-7
calibration in ControlWave EFM, GFC, XFC ... 9-1
configuration in 4088B ... 10-2
verification in 3530 ... 8-2
verification in ControlWave EFM, GFC, XFC ... 9-2

E

EBSAP group number
changing the ... 4-11
Editing
archive files ... 11-4
lists ... 11-1
Extended Verification
modifying signal names used for ... 4-9

F

Figures
3-1. Opening a Session File ... 3-2
3-2. Communication Setup dialog box - BSAP. 3-3
3-3. Communication Setup dialog box - IP ... 3-4
3-4. Advanced Communication Parameters dialog box - BSAP ... 3-4
3-5. Dial Parameters ... 3-6
3-6. Advanced Communication Parameters dialog box-IP ... 3-7
3-7. Node Setup dialog box ... 3-9
3-8. Calibration Setup dialog box ... 3-11
3-9. Transmitter Setup dialog box – Initial View 3-13
3-10. Transmitter Identification dialog box ... 3-14
3-11. SignOn to RTU dialog box ... 3-15

4-1. TechView Overview 4-2
4-2. Copying a Session 4-3
4-3. Application Settings dialog box 4-4
4-4. Create Session File 4-5
4-5. Open Session File 4-5
4-6. Node Status box 4-6
4-7. Communication Statistics window 4-6
4-8. Application Settings dialog box – Security tab 4-7
4-9. Application Settings dialog box – General tab 4-8
4-10. Modifying Calibration Signal Names 4-9
4-11. Extended Verification Signals dialog box. 4-10
4-12. Changing the name of a transmitter 4-11
4-13. Changing the Local Address or Group Number 4-11
4-14. Version Information dialog box 4-12
4-15. Notes dialog box 4-13
4-16. OpenBSI System Processes 4-13
4-17. Deleting Historical Data 4-14
5-1. Identifying the Local Port 5-5
5-2. Typical Setup for MVT Calibration 5-6
5-3. Typical Calibration Setup of GPT Using Test Pressure 5-6
5-4. Entering Calibration Mode 5-8
5-5. Exiting Calibration Mode 5-8
6-1. DP Tab - Calibrating Differential or Gage Pressure 6-1
6-2. SP Tab - Calibrating Static Pressure 6-3
6-3. T-tab Calibrating RTD Temperature 6-5
6-4. Calibrating Differential or Gage Pressure 6-6
7-1. DP tab - Calibrating Gage or Differential Pressure 7-1
7-2. SP tab – Calibration of Station Pressure 7-2
7-3. T tab – Calibration of RTD Temperature. 7-3
7-4. Model 3808 Transmitter Calibration Connection Diagram 7-4
7-5. 3808 Analog Output Calibration – Voltage Measurement Diagram 7-5
7-6. 3808 Analog Output Calibration – Current Measurement Diagram 7-6
7-7. AO tab – Calibrating the Analog Output .. 7-6
8-1. DP tab – Calibration of Differential or Gage Pressure 8-1
8-2. SP tab – Calibration of Static Pressure ... 8-3
8-3. T tab – Calibration of RTD Temperature. 8-4
8-4. TeleFlow CPU Board RTD Calibration Connection Diagram 8-5
8-5. Damping tab 8-6
8-6. 3530-45B or 55B TeleRecorder Pressure Transducer Connections 8-8
8-7. Main tab 8-8
9-1. DP tab – Calibration of Differential or Gage Pressure 9-1
9-2. DP tab – Verification of Differential or Gage Pressure 9-3
9-3. SP tab – Calibration of Static Pressure ... 9-4
9-4. SP tab – Verification of Static Pressure .. 9-5
9-5. T tab – Calibration of RTD Temperature. 9-6
9-6. Connections for RTD Temperature Calibration – EFM, GFC, GFC-CL 9-8
9-7. Connections for RTD Temperature Calibration – XFC 9-9
9-8. T tab – Verification of Temperature 9-10
9-9. Damping tab 9-11
9-10. Orifice tab 9-12
11-1. Lists tab - Online Editing of Signal Lists 11-2
11-2. Archives tab - Online Editing of Archives 11-4
11-3. Archive Column Definition 11-6
11-4. Batch Edits tab 11-7
A-1. Advanced Interface Setup dialog box A-1
A-2. Sample INI File A-14
Firmware version
viewing the 4-12
Flash Configuration utility
starting the 4-12

G

Gage pressure
calibration in 3508 6-1
calibration in 3530 8-1
calibration in 3808 7-1
calibration in 4088B 10-7
calibration in ControlWave EFM, GFC, XFC .. 9-1
configuration in 4088B 10-2
verification in ControlWave EFM, GFC, XFC . 9-2
group number
changing the 4-11

H

Historical data
clearing 4-13

I

Icons
in tool bar 4-2
Initialization files A-1
Inputs
calibration in 3530-45B and -55B 8-7
Installation 2-1

L

Lists
online editing 11-1
local address
changing the 4-11
LRL
defined 5-2
LRV
defined 5-2

M

Measured Variable 5-1
Measurement group 12-1

N

Node Setup dialog box 3-8
Node Status dialog box 4-6
Notes
  leaving 4-12

O

Online editing
  archive files 11-4
  signal lists 11-1
Orifice
  specifying plate diameter for ControlWave EFM, GFC, XFC 9-12

R

RTD
  calibration in 3508 6-5
  calibration in 3530 8-4
  calibration in 3808 7-3
  calibration in 4088B 10-9
  calibration in ControlWave EFM, GFC, XFC .. 9-6
  coefficients in 4088B 10-6
  verification in 3530 8-6
  verification in ControlWave EFM, GFC, XFC . 9-9

S

Security
  signing on 3-15
  tab in Application Settings dialog box 4-7
Serial port
  configuration in 4088B 10-4
Session
  changing parameters for 4-2
  copying to another name 4-3
  restarting 4-3
  saving your session file 4-3
Session file 3-1
Signing On 3-15
SPAN
  defined 5-2
Starting TechView 3-1
Startup
  parameters for a session 4-4
Static pressure
  calibration in 3508 6-3
  calibration in 3530 8-2
  calibration in 3808 7-2
  calibration in 4088B 10-7
  calibration in ControlWave EFM, GFC, XFC .. 9-4
  configuration in 4088B 10-2
  verification in 3530 8-3
  verification in ControlWave EFM, GFC, XFC . 9-5

T

Tables
  4-1. Default variable names for extended verification 4-10
  A-1. Advanced Interface Setup File Components A-2
TechView
  starting 3-1
TechView session file 3-1
Temperature
  calibration in 3508 6-5
  calibration in 3530 8-4
  calibration in 3808 7-3
  calibration in 4088B 10-9
  calibration in ControlWave EFM, GFC, XFC .. 9-6
  configuration in 4088B 10-3
  verification in 3530 8-6
  verification in ControlWave EFM, GFC, XFC . 9-9
Transmitter
  renaming 4-11
Transmitter Data menu 10-5
Transmitter Identification dialog box 3-14
Transmitter Setup page 3-13

U

URL
  defined 5-2
URV
  defined 5-2

V

Verification
  modifying signal names used for 4-8
  of differential or gage pressure in ControlWave EFM,GFC,XFC 9-2
  of differential pressure in 3530 8-2
  of RTD Temperature in 3530 8-6
  of RTD Temperature in ControlWave EFM, GFC, XFC 9-9
  of Static pressure in 3530 8-3
  of static pressure in ControlWave EFM,GFC,XFC 9-5

Z

ZERO
  defined 5-2

Headquarters:
Emerson Process Management
Remote Automation Solutions
6005 Rogerdale Road
Houston, TX 77072 U.S.A.
T +1 281 879 2699 | F +1 281 988 4445
www.EmersonProcess.com/Remote

Europe:
Emerson Process Management
Remote Automation Solutions
Emerson House
Unit 8, Waterfront Business Park
Dudley Road, Brierly Hill
Dudley UK DY5 1LX
T +44 1384 487200 | F +44 1384 487258
www.EmersonProcess.com/Remote

North American/Latin America:
Emerson Process Management
Remote Automation Solutions
6005 Rogerdale Road
Houston TX USA 77072
T +1 281 879 2699 | F +1 281 988 4445
www.EmersonProcess.com/Remote

Middle East/Africa:
Emerson Process Management
Remote Automation Solutions
Emerson FZE
P.O. Box 17033
Jebel Ali Free Zone – South 2
Dubai U.A.E.
T +971 4 8118100 | F +971 4 8865465
www.EmersonProcess.com/Remote

Asia-Pacific:
Emerson Process Management
Remote Automation Solutions
1 Pandan Crescent
Singapore 128461
T +65 6777 8211| F +65 6777 0947
www.EmersonProcess.com/Remote

© 2014 Remote Automation Solutions, a business unit of Emerson Process Management. All rights reserved.

Remote Automation Solutions, a business unit of Emerson Process Management, shall not be liable for technical or editorial errors in this manual or omissions from this manual. REMOTE AUTOMATION SOLUTIONS MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THIS MANUAL AND, IN NO EVENT SHALL REMOTE AUTOMATION SOLUTIONS BE LIABLE FOR ANY INCIDENTAL, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PRODUCTION, LOSS OF PROFITS, LOSS OF REVENUE OR USE AND COSTS INCURRED INCLUDING WITHOUT LIMITATION FOR CAPITAL, FUEL AND POWER, AND CLAIMS OF THIRD PARTIES.

Emerson Process Management Ltd, Remote Automation Solutions (UK), is a wholly owned subsidiary of Emerson Electric Co. doing business as Remote Automation Solutions, a business unit of Emerson Process Management. FloBoss, ROCLINK, ControlWave, Helicoid, and OpenEnterprise are trademarks of Remote Automation Solutions. AMS, PlantWeb, and the PlantWeb logo are marks owned by one of the companies in the Emerson Process Management business unit of Emerson Electric Co. Emerson Process Management, Emerson and the Emerson logo are trademarks and service marks of the Emerson Electric Co. All other marks are property of their respective owners.

The contents of this publication are presented for informational purposes only. While every effort has been made to ensure informational accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. Remote Automation Solutions reserves the right to modify or improve the designs or specifications of such products at any time without notice. All sales are governed by Remote Automation Solutions' terms and conditions which are available upon request. Remote Automation Solutions does not assume responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use and maintenance of any Remote Automation Solutions product remains solely with the purchaser and end-user.